The impact of equity analyst recommendations on market attention, price-consensus and the behaviour of other analysts

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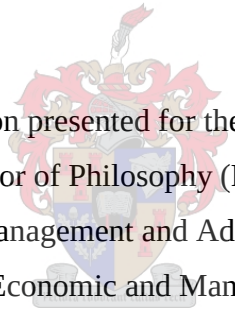

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Declaration by the candidate:

With regard to Chapter 2, the nature and scope of my contribution were as follows:

Nature of contribution	**Extent of contribution (%)**
Both authors worked together in writing the article throughout, doing the calculations, and interpreting the results. My contribution to the calculations exceeded that of the other author, while the inverse is true for the written text.	50%

With regards to Chapter 2, the contributions were as follows:

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Date: December 2015

Declaration by co-author:

The undersigned hereby confirms that:

(i) The declaration above accurately reflects the extent of the contributions of the candidate and the co-author to Chapter 2;

(ii) No other authors contributed to Chapter 2 besides those specified above; and

(iii) Potential conflicts of interest have been revealed to all interested parties and the necessary arrangements have been made to use the material in Chapter 2 of this dissertation.

Signature of co-author: D.F. Gerritsen

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Abstract

Analysts are valuation specialists who advise both institutional clients and non-professional investors on the choice and timing of security purchases and sales. The analysts' advice may have hugely beneficial or unfavourable outcomes for those who rely on them. This study investigated the possible influence of 901 local and international analysts' recommendations that were issued from 1993 to 2011 on shares listed on the Johannesburg Stock Exchange (JSE).

The short-term impact of recommendations on prices and possible behavioural tendencies among analysts, including a reported inclination to issue overly-positive recommendations, were respectively investigated in the first two empirical chapters. Thirdly, the success rate of analysts to issue recommendations with an advised directional impact and possible herding behaviour among analysts were researched. The empirical chapters conclude with an investigation into changes in investor attention (as proxied by traded volumes) and price volatility around analysts' recommendations. The efficient market hypothesis and the 'differences of opinion' theories were used as fundamental points of departure and interpretation.

More than 37 000 recommendations, ranging from strong buy to strong sell, were used in an event-study methodology to analyse the market's reaction to these recommendations. Advanced modelling techniques were implemented in Excel and VBA to analyse daily consensus opinions, positive- versus negative sentiment, analyst activity and reactions, the frequency of abnormal price reactions, abnormal price movements, abnormal traded volumes, and changes in price volatility surrounding recommendation revisions.

The study found that analyst recommendations were followed by an abnormal reaction in prices and that the magnitude of a recommendation's change (e.g. a three-step change from strong sell to buy versus a one-step change hold to buy) had a greater impact than a recommendation's absolute level. A portfolio strategy revealed the possible benefit of recommendations for investors. Analysts issued their opinions using different patterns within the five possible recommendation categories, and issued the same proportion of negative recommendations during periods of low business confidence and economic contraction than during growth- and economic upswing phases. Analysts who issued more recommendations in total were not more influential than less active analysts, and not all analysts were able to issue recommendations with a large advised directional abnormal impact. As expected, recommendations that had a large abnormal price impact generated some herding activity among the other analysts who covered the same share. Investor attention increased around the issuance of recommendation revisions, and price volatility increased after large recommendation upgrades.

In support of market efficiency, investors seemed able to trade at new price levels and execute their trades with sufficient liquidity following recommendations. Results that infer differences of opinion were present both among analysts and investors: competing analysts did not issue the same recommendations for the same shares and favoured different recommendations categories; and investors only acted on some of the recommendations. Furthermore, analysts did not have the same propensity to cause abnormal price reactions. Traded volumes increased around recommendation revisions, showing that investors paid attention to recommendations.

Key words:

Analyst recommendations

Abnormal price impact

Overly positive

Intended impact

Influential recommendation

Investor attention

Opsomming

Analiste spesialiseer in die waardasie van maatskappye en adviseer beide institusionele- en nie-professionele beleggers rakende die keuse en tydsberekening van hul kope en verkope. Díé advies kan baie voordelige of nadelige gevolge hê vir diegene wat daarop staatmaak. Hierdie studie het die moontlike invloed ondersoek van 901 Suid-Afrikaanse en internasionale analiste se aanbevelings rakende JSE-genoteerde aandele tussen 1993 en 2011.

Die eerste twee empiriese hoofstukke ondersoek (i) die korttermyn impak van analiste se aanbevelings op pryse en (ii) moontlike gedragspatrone onder analiste, insluitend ‘n gerapporteerde neiging om oor-positiewe aanbevelings uit te reik. Derdens is analiste se sukseskoers om aanbevelings met ‘n verwagte impak uit te reik en moontlike ‘trop’-gedrag onder analiste nagevors. Die empiriese hoofstukke sluit af met ‘n ontleding van veranderinge in beleggers se aandag (soos aangedui deur verhandelde volumes) en prysvolatiliteit rondom analiste se aanbevelings. Die effektiewe markhipotese en die ‘verskil in opinie’ teorie was gebruik as fundamentele grondslag en om resultate te interpreteer.

‘n Gebeurtenis-studie metodologie is gebruik om die mark se reaksie op meer as 37 000 aanbevelings, wat van sterk koop tot sterk verkoop strek, te analiseer. Gevorderde modelleringstegnieke is in Excel en VBA geïmplementeer om konsensus opinies, positiewe- vs. negatiewe sentimentsperiodes, analiste se aktiwiteitsvlakke en reaksies, abnormale prysreaksies en die voorkoms daarvan, abnormale verhandelde volumes, en veranderinge in prysvolatiliteit rondom aanbevelings hersienings te bereken en te analiseer.

Die studie het bevind dat analiste se aanbevelings wel gevolg is deur abnormale prysbewegings, en dat die grootte van aanbevelings se hersienings (bv. ‘n drie-stap hersiening van sterk verkoop na koop versus ‘n een-stap hersiening van hou na koop) ‘n groter impak as die aanbeveling se absolute vlak gehad het. ‘n Portefeulje strategie het ook die moontlike voordeel van aanbevelings vir beleggers uitgelig. Analiste het verskillende patrone binne die vyf-punt aanbevelingskategorieë gebruik om hul opinies te kommunikeer, en het dieselfde proporsie negatiewe aanbevelings tydens periodes van swak besigheidsvertroue en ekonomiese afswaai uitgereik as tydens periodes van groei en ekonomiese opswaai. Analiste wat meer aanbevelings in totaal uitgereik het, was nie meer invloedryk as ander analiste nie, en nie alle analiste het aanbevelings wat ‘n groot abnormale prysreaksie veroorsaak het, uitgereik nie. Soos verwag het aanbevelings, wat groot abnormale prysbewegings veroorsaak het (invloedryke aanbevelings), ‘trop’-gedrag veroorsaak onder kompeterende analiste. Beleggers se aandag het toegeneem met die uitreik van hersienings, en prysvolatitliteit het toegeneem ná groot aanbeveling-opgraderings.

Beleggers kon teen nuwe prysvlakke verhandel en hul besluite uitvoer met genoeg likiditeit nadat aanbevelings uitgereik is, wat indikatief van mark-effektiwiteit is. Resultate dui ook op verskillende opinies tussen beleggers en analiste: analiste het verskillende aanbevelings vir dieselfde aandele uitgereik en het verskillende aanbevelings-kategorieë verkies, en beleggers het nie op alle analiste se aanbevelings gereageer nie soos aangedui deur pryse en volumes. Analiste het verder nie dieselfde geneigdheid gehad om abnormale prysveranderinge te veroorsaak nie. Verhandelde volumes het toegeneem rondom aanbevelingshersienings, wat aandui dat beleggers wel aandag aan die analiste se aanbevelings gegee het.

Sleutelwoorde:

Analis aanbevelings

Abnormale prys-impak

Oormatig positief

Gewensde impak

Invloedryke aanbeveling

Belegger aandag

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Dedications

I firstly dedicate this dissertation to Lana – you are the most excellent, understanding and supportive of wives. Thank you for your love and encouragement during this arduous process, and for being a constant reminder that we can climb mountains we never thought possible.

I also dedicate the work I did here to my Heavenly Father – All the good in me has been Your doing, and all honour will be Yours. I am so thankful for the grace You have bestowed upon my life and for this opportunity to further my studies.

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List of acronyms and abbreviations

AIF	advised impact frequency
ALSI	All Share Index
AR	Abnormal return
BCI	Business Confidence Index
BER	Bureau for Economic Research
BSA	buy-side analyst
CAR	cumulative abnormal returns
CMAR	cumulative market-adjusted return
CRAR	cumulative risk-adjusted return
EMH	efficient market hypothesis
E/P	earnings-price ratio
HML	high minus low
I/B/E/S	(Thomson Reuters) Institutional Brokers' Estimates System
IPO	initial public offering
JSE	Johannesburg Stock Exchange
LFR	leader-follower ratio
MAR	market-adjusted abnormal return
RAR	risk-adjusted abnormal return
RMB	Rand Merchant Bank
SARB	South African Reserve Bank
SMB	small minus big
SSA	sell-side analyst
SV	standardised volume
US	United States (of America)
VBA	Visual Basic for Applications

CHAPTER 1:
INTRODUCTION

Equity analysts are considered to be company-valuation specialists. Their profession centres around the idea that they are able to generate expert forecasts for share price levels and company earnings, and advise investors by issuing trade recommendations in the form of buys, holds and sells (Womack, 1996). Investors globally are influenced by the reports and recommendations issued by security analysts; some investors profit from the advice while other investors may regret that they followed the advised action. With billions of dollars' worth of shares changing hands every day, it is of little surprise that the recommendations and their impact on equity markets have received much attention by both investors and researchers over many years (earliest research by Cowles, 1933). In their simplest form, analyst recommendations indicate an advised action and direction of change in the context of current price levels and market conditions. Analysts may start covering new shares, change their opinions or even end their recommendation coverage at any time and for a variety of reasons, and investors in turn will have to pay attention to or ignore the analysts' opinions in the light of all the information they have in their possession.

Investors are assumed to simply ask if a recommendation is new information that could be used to either increase or protect their wealth by buying, selling or keeping an asset. These investors will only act upon the recommendation if they have a conviction that the recommendation is either a credible interpretation of information by the analyst, or the release of information that was previously unknown (Hong, Stein and Yu, 2007). One group of investors must not only agree that the information is noteworthy, but also have a conviction to react to an analyst's recommendations for the analyst's opinion to have an effect on market prices; while another group of investors must have an opposing opinion to ensure that a counterparty to the trade can be found. Investors must furthermore decide to trust one analyst's opinion over that of another if the analysts provided different opinions (Loh and Stulz, 2011). Professional investors are expected to rely less on recommendations than non-professional investors due to their confidence in their own skill (Kelly, Low, Tan and Tan, 2012), with both of the aforementioned groups aiming to create wealth by buying and selling shares at the optimal points in time.

In contrast to the belief by investors that they can generate market-beating returns by interpreting information and listening to good advice, efficient market theories propose that no single investor will be able to outperform the market over time as all prices will instantly reflect new information concerning companies (Bidwell, 1977). Investors who do react to information disregard the efficient market hypothesis's suggestion of equality and uniform information processing abilities among

analysts. That said, the 'differences of opinion' theory suggested by Harris and Raviv (1993) allows for subjective interpretation of information and different reactions due to factors such as overconfidence, mental framing and anchoring by investors and analysts alike.

The very existence of the analysts' profession is a token of investors' belief and reliance upon analyst recommendations. Analysts would not have employment opportunities if investment companies did not believe that they offered a profitable service (Womack, 1996) and that analysts cause investors to react differently from the efficient market hypothesis's purported instantaneous and perfect price adjustments (Grossman and Stiglitz, 1980). The notions of expertise and varying levels of skill among analysts must therefore exist in the eyes of investors.

A famous quote in the book *Animal Farm* by George Orwell (1946:52) might be a good starting point to understanding the gap between efficient market theories and the attention paid to analysts by investors. Orwell asserted that "All animals are equal, but some animals are more equal than others". This might be rephrased to 'All analysts are equal, but some analysts are more equal than others' to bridge the gap between the real-world reactions of investors to various analysts' recommendations and the efficient market theory's suggestion of immediate information dissemination and uniform reactions by analysts and investors alike.

The main objective of this study was to investigate the impact of analyst recommendations on JSE-listed shares and analyst activity in the contexts of both the efficient market hypothesis (EMH) (Fama, 1970) and the effects of behavioural biases that create diverse reactions to the same information (Harris and Raviv, 1993).

1.1 BACKGROUND TO ANALYSTS AND ANALYST RECOMMENDATIONS

An evaluation of analyst recommendations requires some insight into the analysts, the various types of recommendations they may issue, the recommendations' proposed 'value-add' for investors and of price formation resulting from new information. This section provides an overview of the aforementioned concepts in order to provide the necessary context to present the research conducted in this dissertation. Also note that existing literature refers to all the recommendations from analysts as 'analyst recommendations', and the terminology is used as such when referring to this portion of analysts' reports.

1.1.1 Analysts

Security analysts are individuals who scrutinise financial data to not only decide if they potentially want to invest themselves, but to advise others concerning the future expectations of share prices and companies' earnings. Analysts therefore differ from normal investors in that they evaluate

information for the purpose of forming judgments that will influence the sentiment, opinions and ultimately the trades of other investors. The three types of information issued by analysts are recommendations, price targets (the analyst's expectation of the share's price level at a future date) and earnings forecasts (Asquith, Mikhail and Au, 2005). Investors need to judge this information and decide if the specific report is noteworthy and influential. Not only may the content of these reports influence the investors' decisions, but the individual analysts' reputations and type of employment or affiliations may play a role when investors evaluate an analyst's report.

While some analysts may choose to stay wholly independent or work for independent research companies, other analysts choose to work for investment banks or companies that could have close ties and shared interests with some of the companies the analysts are evaluating. The 'independent' analysts are trusted more by investors to issue unbiased opinions because the other, non-independent analysts may be influenced by their corporate links to listed companies. The positive reports and buy recommendations of independent analysts had a greater influence on share prices than those of their investment-banking counterparts in one study, while their negative reports and sell recommendations had less of an influence than those of the investment banking analysts (Barber, Lehavy and Trueman, 2007). This may have occurred because investors believed that independent analysts only issue positive reports when they are convinced that a share price should rise, while the negative opinions of investment-banking analysts might be trusted more because investors suspect a very strong conviction on the part of these analysts when they issue negative reports in the light of their connection to the companies.

Another differentiation between analysts is if they can be 'affiliated' or 'unaffiliated' to a company that has an underwriting relationship with the analyst's employer (Lin and McNichols, 1998). 'Affiliated' analysts are analysts employed by either the lead-underwriter bank or the co-underwriter bank, while 'unaffiliated' analysts may be 'independent' analysts or employed by other banks. Lin and McNichols (1998) reported that 'affiliated' analysts issued reports for the under-written companies that were more positive than the reports of the 'unaffiliated' analysts, especially around initial public offerings (IPOs), but that the market only reacted significantly to the 'affiliated' analysts' hold recommendations, reportedly because investors interpreted the hold recommendation as a sell because of the analysts' affiliation or corporate ties.

An analyst may also be employed as a buy-side analyst (BSA) or a sell-side analyst (SSA). SSAs are normally employed by brokerages or banks, and they issue recommendations and reports to the employers' clients and sometimes the public. BSAs, on the other hand, are normally employed by asset managers who do not release their analysts' reports to the public (Cheng, Liu and Qian, 2006). Investors will therefore not be able to react to the information produced by BSAs because the

BSA's reports and recommendations are normally kept confidential. This study therefore only contains the recommendations of SSAs. An example of an SSA's report is available in Appendix A.

The forecasting techniques and the style of investing preferred by an analyst will also influence his or her decision-making process and the resultant recommendations. Analysts can broadly be classified as either technical- or fundamental analysts. The technical analysts may use observation or quantitative methods to analyse historic price data, while fundamental analysts may weigh factors ranging from the state of the world economy or a country's economic cycle through to industry- or company-specific information. Kumar, Mohapatra and Sandhu (2013) noted that analysts more often used technical methods for short-term forecasts, while fundamental analysis was preferred when making estimates of longer periods. The valuation model used by analysts has also been found to be a differentiator among analysts, with models using discounted cash-flows, price-earnings ratios and dividend yields among the preferred methods applied by analysts (Demirakos, Strong and Walker, 2004).

The type of employer and the relationship of the employer with listed companies may therefore influence the reports and recommendations of the analysts, whether the analyst is independent or employed. The next subsection will discuss the recommendations issued by analysts.

1.1.2 Analyst recommendations

Analyst recommendations for shares are commonly issued according to a 'buy-hold-sell' format. The five-point recommendation scale, ranging from strong buy to strong sell, was used for the purposes of this study (Barber, Lehavy, McNichols, and Trueman, 2001). The five recommendation categories and their respective numeric indicators are:

Strong buy (1) Buy (2) Hold (3) Sell (4) Strong sell (5)

It is important to note that the recommendation categories are classified using an ordinal scale of '1' to '5'. The magnitude of the issuing analyst's expected future change in a share's price, as well as the timeframe over which these changes might occur, are thus open to interpretation if the recommendation is not supported by a detailed report or price target. Investors may therefore react differently to the same information due to their subjective interpretation of the recommendation and the perceived intensity of the analysts' opinion.

Analysts' recommendations can further be grouped into different types of recommendations. Recommendations issued by an analyst for the first time on a specific share are called 'initiations'; changes in recommendations by an analyst are called 'revisions'; and a permanent or temporary ending of coverage is referred to as a 'stop' or a 'drop'. If an analyst drops a share from his or her

coverage only to resume recommendations again at a later stage, the first recommendation after the stop is also called an 'initiation'. The overall or average recommendation of all the analysts for one specific company is further referred to as the 'consensus'- or average recommendation (Barber *et al.*, 2001).

Analysts may revise a recommendation upward or downward, indicating an improved or poorer outlook respectively. When an analyst revises a recommendation, the magnitude of the upgrade or downgrade is also important for investors to consider. Revisions can range from a one-step change through to a maximum four step-change, regardless of the direction of the revision. Examples of a one-step change include a strong buy to buy downgrade or a sell to hold upgrade. There are only two four-step revisions namely a strong buy to strong sell downgrade and *vice versa*.

Provided that a recommendation or report attracts enough attention from investors, share prices can be influenced because market participants are now willing to transact at different price levels. Some of the factors influencing how analysts form their opinions and how the market reacts are presented in the next subsection.

1.1.3 New information flow and trade execution

Two phases of information flow must happen for a recommendation to have an impact on share prices.

Firstly, an analyst must receive or be in possession of information that causes the analyst to initiate, revise or stop a specific recommendation. Analysts are trusted by investors to have access to and knowledge of all relevant information when they issue new recommendations. The information and circumstances influencing what information an analyst presents to the market are reported to range widely, as well as the amount of importance that an analyst assigns to each of the aforementioned. Analysts have been described to assign more weight to a company's strategic statements than its financial reports (Kerl, Stolper and Walter, 2012), with industry-specific factors having a major influence on the analyst's opinion (Previts, Bricker, Robinson and Young, 1994). Analysts may further offer overly-positive recommendations due to remuneration- and employment factors (Irvine, 2001; 2004), or be side-tracked because of paying too much attention to macro factors and neglecting a company's specific information (Peng and Xiong, 2006). All-in-all, analysts are reported to make the market more efficient by improving valuation accuracy among investors (Jegadeesh, Kim, Krische and Lee, 2004).

Secondly, the recommendation, along with all other information, must be received by investors who are willing and able to react according to their interpretation of the new information. The investor who considers the new information must therefore be an attentive, active market participant who

has the means to buy or sell shares, or to hold onto shares bought in the past. The impact of an analyst's recommendation can only be measured if investors are able to find counterparties to trade with and if they are able to trade shares at new prices. Traded volumes are thus normally expected to increase after the arrival of new information (He and Wang, 1995), resulting in abnormal traded volumes over and above the normal, expected traded volumes. The time it takes for information to be reflected in prices can be share-, industry- and country specific (Coppejans, Domowitz and Madhavan, 2004), and prices will normally fluctuate for a while after new information is released because of disagreement about the appropriate response to the information among market participants (Harris and Raviv, 1993).

Even if investors across different sectors and market-capitalisations have the same directional intent after receiving new information (e.g. a six per cent rise in prices), the subsequent price reactions might differ. Less liquid shares may reflect new information slower than very liquid shares (Chordia and Swaminathan, 2000; Coppejans *et al.*, 2004). Furthermore, smaller capitalisation shares' liquidity and volatility may be less predictable than those of larger capitalisation shares (Almgren, 2012). New public information would normally coincide with both higher price volatility and traded volumes, but new private information is expected to only coincide with increased traded volumes (He and Wang, 1995). Abnormal traded volumes without price changes might therefore indicate insider trading.

An analysis of the stimuli-reaction effect present in equity markets is further investigated in Section 1.1.4 as background for the trade execution discussed in this section.

1.1.4 Chickens and eggs: the mechanism of information flow and price formation

Information flow in reality is not predictable in terms of the timing, the content, or the impact thereof, making it very difficult or even impossible to describe a system that will accurately convey either the occurrence or the impact of new information flows in the context of recommendations (Kendall and Hill, 1953). Understanding the impact and arrival of information flows is further complicated by the notion that "markets are not orderly or simple", but that they are "messy and complex" (Peters, 1991:9) because of behavioural tendencies inherent to investors who collectively make up international capital markets. The arrival of a recommendation relative to other information and the magnitude of the recommendation's impact on a share's price are therefore very difficult to determine even if all the information regarding the recommendation itself is available.

The ‘What came first – the chicken or the egg?’ saying is appropriate when viewing the timing of the arrival of a recommendation versus the publication of the economic, industry- or company-specific information supporting and/or influencing a recommendation. Two simplified scenarios may play out here:

(i) In the first scenario, an analyst receives the relevant information simultaneously to other market participants and the two groups form their respective opinions at more or less the same time. Declaration of higher-than-expected earnings or announcements of very lucrative deals or ventures are examples of where the agreement concerning the direction of the price change will be the same, but disagreement regarding the exact prudent reaction to the new information will occur more often than not. In this scenario, the announcement is the stimulus, while the recommendation is the reaction of the analyst during more or less the same timeframe as the other investors. Analysts who issue recommendations after big announcements have been described to ‘piggy-back’ on those announcements (Altinkiliç and Hansen, 2009).

(ii) The second scenario is where the analyst uses superior skill and/or information-gathering abilities to ‘produce’ and disseminate new information by forming a new and influential interpretation of information. In this scenario, the recommendation is the stimulus causing a reaction among investors and may even activate other analysts to revise their existing recommendations. An analyst who is the first to produce and convey new information is called a ‘leader-analyst’ (Welch, 2000).

Suggesting that a recommendation is the only information influencing an investor, or the only piece of new information to influence an investor during a certain timeframe, is a dangerous oversimplification of a very complex system. A further notion, namely that all investors will interpret the information in the same way, is also not sensible because no counterparties to trades would ever be available if all market participants held exactly the same views (Peters, 1991). The aforementioned implies that investors may assign differing amounts of importance to various pieces of information and hold opposing views following a recommendation, providing the opportunity for trades and transactions to happen. Investors therefore act as counterparties because of differences in information processing skills, contrarian investment styles, behavioural biases, or because of being forced to trade a share for reasons outside of valuation purposes or sound investment principles.

Investors who do not have confidence in their own information-gathering and interpretive skills have been noted to over-rely on recommendations that are in the public eye (Malmendier and Shanthikumar, 2007), while skilled investors and fund managers have been reported to sometimes

not follow analysts' recommendations at all (Chen, Jegadeesh and Wermers, 2000) because they disregard the information that flows from analysts or believe they are better skilled in interpreting information. Unfortunately, unskilled investors may trade more frequently and profit less from the information they receive (Mikhail, Walther and Willis, 2004).

When investors do buy or sell a share after being influenced by a recommendation, the resultant movement in the price is termed the 'impact' of the recommendation. Overall, analyst recommendations have been demonstrated to have investment value for investors, both in developed markets (Stickel, 1995; Womack, 1996; Barber *et al.*, 2001; Boni and Womack, 2006) and in emerging markets like South Africa (Hall and Millard, 2002; Prayag and Van Rensburg, 2006). The magnitude of the impact may differ among countries (Jegadeesh and Kim, 2006), among industries and market sectors (Boni and Womack, 2006), and among analysts (Barber, Lehavy and Trueman, 2000; Hobbs, Kovacs and Sharma, 2012; Balashov, 2013). The impact of a recommendation might also be short lived or intra-day if not accompanied by various credible supportive reports (Savor, 2012; Asquith *et al.*, 2005), or prices may react for a prolonged period of time if emotions like fear and greed are influencing many investors (Shefrin, 2000).

The following subsection contextualises investors' reported ability to act rationally when interpreting new information.

1.1.5 Irrationality among investors

A rational investor is defined as an investor who can price a security correctly after a prudent valuation of the underlying assets based on all available information (Peters, 1991). There are three main expectations that would be present in a simplified model of analyst recommendations as stimuli and the subsequent price moves as reaction if investors respond rationally to the stimuli:

(i) Investors will react quickly to a recommendation in order to reflect future expectations in the current share price, and after the price adjustment the price will remain fairly stable until new information is available (Fama, 1970);

(ii) The direction of the impact of recommendations should always align with the sentiment conveyed by an analyst in a recommendation. In other words, a buy recommendation will be followed by a rise in a share's price, while a sell recommendation will result in a fall in the share's price (Barber *et al.*, 2001); and

(iii) Investors are expected to react more positively (negatively) to a strong buy than to a buy (strong sell than a sell). For example, if a strong buy recommendation normally results in a one per cent increase in prices for a specific share, a buy recommendation could be expected to cause an increase above zero per cent but below one per cent. A roughly linear price reaction to the amount of positivity or negativity in a recommendation should thus be expected, and each reaction should be entirely independent from all previous reactions (Peters, 1991).

The three simplified aforementioned expectations do not take into account behavioural biases and irrationality among investors. While it is not impossible for any of the three simplified expectations to occur, existing empirical literature infers that it is highly unlikely for any of the three to occur as a rule. The counter-evidence in the context of recommendations is discussed in the same order that the simplified expectations in this section were presented:

(i) Womack (1996) provided evidence that prices did react significantly for an average of three days after recommendations were released, but also noted that a price drift that may last for months followed influential recommendations. The short-term impact of recommendations (see also Stickel, 1995; Barber *et al.*, 2001; Hall and Millard, 2002; Boni and Womack, 2006) supports the notion of an efficient market, but the price drift following a recommendation (Bhana, 1990; Womack, 1996; Jegadeesh *et al.*, 2004; Prayag and Van Rensburg, 2006) supports the notion that not all investors react immediately or that price-agreement is not necessarily reached over the short term. The delayed reaction by some investors may happen because of conservatism or fear, and the subsequent price momentum because of delayed herding.

(ii) The direction of investors' reactions has also been documented to sometimes be contrary to the sentiment conveyed through a recommendation. Fitzsimons and Lehmann (2004) reported that advice going against a person's initial sentiment and conveyed at a time not appropriate for the person, resulted in a direct opposite reaction to the advice. Analysts who have a contrarian view on a stock may also release negative recommendations while the rest of the analysts are positive, and other 'first-mover' analysts may be the first to issue negative recommendations at the end of a positive trend. These recommendations do not immediately have the advised reaction as investors may still have too much confirmatory evidence from other analysts' positive recommendations and might still have overconfidence (conservatism) resulting from a prolonged bullish (bearish) market (Cooper, Day and Lewis, 2001). Peters (1991) supported this notion by saying that investors will generally struggle to identify a trend until it is well established. Another documented scenario describes overconfident investors

who prematurely overinflated a share's price following a series of upward earnings revisions over time, because they were expecting high earnings again. In this case a downward price-correction happened although the news and recommendations were positive (Shefrin, 2000).

(iii) The assumption of linearity in the reactions by investors has not been reported when individual recommendations and analysts were considered. Different analysts have been reported to have different magnitudes of impact (Cowles, 1933; Welch, 2000), as well as differences in skill when interpreting information and in timing the release of recommendations (Hobbs *et al*., 2012). In a specific study only one in ten recommendations issued caused a significant abnormal return (Loh and Stulz, 2011). Shefrin (2000) also reported an incident where consecutive buy recommendations delivered positive returns, while a strong buy recommendation that followed the buy recommendations was preceded and followed by downward price-adjustments due to fear among investors.

The intricacies and inconsistencies alluded to in the counter-evidence section above portray complex, non-linear market mechanisms (Peters, 1991). New information should thus be expected to compete with both investor sentiment and all other preceding information flows, making the stimuli-reaction model for an individual investor a complex, dynamic multivariate model and not a simple univariate model. Individual investors are unfortunately reported to naturally drift towards a simple univariate model, and also to discard one 'easy and simple' model for the next when the first univariate model does not work according to expectation (Hong *et al*., 2007). The differences in investors' decision-making models are a double-edged sword: it creates the much needed liquidity offered by counterparties who buy (sell) when others are selling (buying), but may also cause severe short-term price fluctuations, wrongful over- and under-pricing of assets, and market-'bubbles' (Shefrin, 2000).

The different opinions of individual investors collectively form the 'market', bringing all of their decision-making systems and varying degrees of purchasing power together on stock exchanges around the globe. The joint reaction of investors to a recommendation thus flows from their individual decision-models, and the resultant reaction can be described by an average of the individual opinions, called 'model averaging' (Hong *et al*., 2007).

1.1.6 Conclusions on price formulation and investor reaction

A great number of factors may influence investors at any time, ranging from macro-economic factors and cycles through to behavioural tendencies inherent to individuals. The reactions of investors can thus vary widely and should not be expected to consistently follow logical and rational paths after they receive recommendations. Recommendations should also not be viewed as

the only information influencing an investor, or as the very first piece of information to convey a certain sentiment, although it could be.

While an analyst may be entirely 'right' in his or her assessment of a share's fair value, investors may not agree with the recommendations and keep a share price overvalued or undervalued for a prolonged period of time. Analysts who subsequently change their recommendations when they expect a price to move to a 'fair value', may seem more influential even though they were not the first ones to interpret all information correctly. Although a measure of market efficiency is supported when information is distributed effectively and trades executed, all results in this dissertation should be interpreted in the light of the uncertainties and anomalies that cannot be accounted for when measuring the impact of recommendations.

1.2 THE RELEVANCY OF MARKET EFFICIENCY TO ANALYSTS

Security analysts are heavily reliant on some form of efficiency in the capital markets. Analysts will want as many investors as possible to weigh their recommendations and include them in their decisions to trade on the one hand, and expect liquidity for investors to be able to execute their decisions on the other hand. Market efficiency goes further than just information-flow and tradability; it includes the degree of agreement among market participants as reflected in the stability of prices (Peters, 1991). In other words, investors in a highly-efficient market will interpret new information in a similar fashion and have a form of agreement about the influence that new information should have, making all assets fairly priced over time with little volatility when there is an absence of new information flows.

The initial research conducted concerning market efficiency and inherent price stability stated that 'random walks', 'oscillatory movements' and 'random fluctuations' were at the order of the day concerning short-term price movements (Kendall and Hill, 1953). Kendall and Hill investigated weekly price stability and famously stated:

> *The series looks like a wandering one, almost as if once a week the Demon of Chance drew a random number from a symmetrical population of fixed dispersion and added it to the current price to determine the next week's price.*

An analyst's recommendation could thus be classified as influential if the opinion was followed by patterns where normal random up-and-down price movements subsided for a period of time because of agreement among investors and even analysts. This agreement would present itself in the form of significant short-term abnormal price movements and traded volumes after the recommendation was issued, heightened activity among competing analysts who revise and align their

recommendations to the influential recommendation, or lasting consensus agreement about the direction of price changes and sustained price momentum over a period of time.

Fama (1970) postulated that information contained in prices at time t, denoted by Φ_t, would cause the following relationship to exist under an uncomplicated form of market efficiency:

$$E(p_{j,t+1}|\Phi_t) = [1 + E(r_{j,t+1}|\Phi_t)] * p_{jt}, \quad ...(1.1)$$

where:

E is the expected value operator,

p_{jt} is the security j's price at day t,

$p_{j,t+1}$ is a random indication of security j's price at day t+1, and

$r_{j,t+1}$ is a random indication of the one-period percentage return.

Simply put – the information contained in prices at day t should still be reflected in the subsequent period's prices, and prices should not vary outside of expected growth patterns if new information is not presented. Fama (1970) further posited that the information contained in prices can be classified as (i) only historic information, (ii) all current public information and (iii) all private 'monopolistic' information under the weak-, semi-strong- and strong market efficiency forms respectively. The strong form of market efficiency cannot be applied in the evaluation of analysts because recommendations would be of no value if analysts were not able to bring new information to light (Hanousek and Kopřiva, 2013) in order to create new opinions among investors. The weak form of market efficiency excludes all currently public information, and hence is also not relevant to this study as the impact of recommendations measures the effect of new public information that can affect prices. Analysts who publish reports and recommendations that are solely based on previously available public information are not expected to have any abnormal impact on security prices because investors will already price past information into the prices of securities.

The semi-strong form of market efficiency is, by process of elimination, the remaining efficiency form that may be applicable. Published financial information, such as earnings per share, dividends, book-to-market, is typical new public information that may have an influence on prices. Analyst recommendations fall into this category of published information, albeit the information contained in recommendations may be argued to be subjective opinions of the analysts or merely a summary of information available to all investors. This body of work aimed to find significant short-term performance patterns to measure if analysts had an impact on prices before Kendall and Hill's (1953) *Demon of Chance* could influence the prices to move randomly again. If analysts were to influence and ultimately change the market's opinions by issuing recommendations, then their

opinions could be deemed to be new information, and in turn an indication of skill and influence among analysts.

The difficulty in judging individual investors' and collective reactions relative to efficient market theory is that information-processing errors have been reported among investors stemming from "the application of false premises and from the use of inadequate rules for drawing inferences from data" (Hunter and Coggin, 1988:287). The next section discusses how different opinions among investors may affect share prices.

1.3 DIVERGENCE OF OPINIONS: A BEHAVIOURAL PHENOMENON

1.3.1 Herding

The opportunity for analysts to provide a value-added service to investors exists only because they are trusted by investors to have better access to information and a superior ability to interpret and predict. When many analysts issue reports and recommendations that align with each other, it is called 'herding' (Jegadeesh and Kim, 2010). One would expect the analysts to broadly concur on the effect that new information should have on prices, but the opposite effect has also been found in a behavioural pattern called 'anti-herding' (Chen and Jiang, 2006). The analysts therefore do not always agree with each other, and neither do investors.

1.3.2 Disagreements

Disagreements about an appropriate price level may happen because of divergent interpretations of the data that is available or unequal ease of access to information that is not publicly available. Harris and Raviv (1993) investigated the aforementioned disagreement among investors, and suggested the following:

(i) When all investors have no aversion to risk and a similar tolerance towards uncertainty, they will agree on whether information should have a 'favourable' or 'unfavourable' outcome. Their disagreement might arise concerning the amount or degree of influence the new information should have on prices.

(ii) When comparing investors who are more 'responsive' to an 'unresponsive' group of investors, the responsive group would assign a greater probability of an increase (decrease) after positive (negative) news than the unresponsive group would.

(iii) Trading of assets will only occur if the cumulative result of historical information swings from positive to negative (negative to positive).

The reaction to new information contained in analyst recommendations should be expected to vary across the spectrum of investors when considering the aforementioned premises. Firstly, investors

might agree about the direction of an abnormal price change following a recommendation, but might disagree on the extent of the impact. All results were therefore scrutinised for a directional change in prices, and positive (negative) abnormal returns were expected after upgrade and buy (downgrade and sell) signals from analysts. Secondly, abnormal traded volumes will invariably be present after both positive- and negative news events if investors are convinced to alter their trades. Thirdly, while this study's main focus was on the short-term impact of new information, the disagreement needed among trade-counterparties to stimulate trading may last for more than a day or two. Their respective positive and negative outlooks after receiving new information will be visible in sequential periods with abnormal returns (called 'price drift' if it persists for a period of time), volume reactions and price volatility over the short to medium term, so this was also investigated in the dissertation.

Price volatility, abnormal traded volumes and price movements occur because of the divergence in the opinions of market participants, and can be surmised to happen because of rational and irrational investors who all transact together on securities exchanges. While investor sentiment can only be deduced by investigating patterns in price volatility, abnormal traded volumes and price movements, analysts' sentiments and opinions are published explicitly when they issue recommendations.

1.3.3 Overly positive opinions

Analysts have been demonstrated to disagree with each other (Clarke, Ferris, Jayaraman and Lee, 2006) and to inherently differ from each other because of a variety of reasons (Hobbs *et al.*, 2012). Analysts may vary in their interpretation of information as well as their skill in timing the release of new information (Hobbs *et al.*, 2012), and only a few of them should be expected to issue recommendations that investors often deem to be noteworthy and influential (Loh and Stulz, 2011). Some analysts even 'lead the pack' and are often the first to assimilate new information and present their recommendations to investors before other analysts issue theirs (Welch, 2000). Inherent differences may lead to some instances of different recommendations concerning a specific share, but analysts' recommendations are reported to differ for other reasons as well.

Aside from variations in skill, one behavioural phenomenon in particular is often associated with analysts in the body of literature: a positive bias. Analysts are often reported to issue overly-positive recommendations (Diefenbach, 1972; Stickel, 1995; Barber *et al.*, 2001) to stimulate trades (Prayag and Van Rensburg, 2006) and protect their affiliations (Kadan, Madureira, Wang and Zach, 2009). Some analysts with many retail clients have even been demonstrated to be overly positive more often than analysts employed by institutional clients (Cowen, Groysberg and Healy, 2006). Analysts

who were overly positive issued buys instead of holds, and holds instead of sells. A positively-biased recommendation is therefore defined as a recommendation that should have been of a lower recommendation category for the purposes of this study.

The next section describes the broad research design and philosophy implemented to investigate the impact of analyst recommendations on JSE-listed shares.

1.4 THE BROAD RESEARCH DESIGN

The two theoretical constructs that underpinned the study, namely the efficient market hypothesis (EMH) and the 'differences of opinion' theory, afforded the opportunity to research both (i) market efficiency and the explicit, intra-day impact of recommendations on shares' prices, and (ii) 'softer' constructs such as market attention, positive biases, herding among analysts, and disagreement among analysts and investors.

An objective, pragmatic philosophical stance forms the foundation of the scientific methods used to investigate the effect of analyst recommendations; and the philosophical stance is supported by the deductive- and explorative approaches that were necessary to add to the current body of knowledge in South Africa and internationally. The existing body of work investigated analyst recommendations in both the contexts of existing theory and widely-observed patterns and behaviour; this study follows suit to investigate if conformity to the theoretical constructs and stylised facts (widely-accepted views and conclusions flowing from observed patterns not necessarily grounded in theory) were present in the results.

While most research questions were grounded on the existing theoretical base and relied on existing methodologies, the expansive and detailed dataset allowed for exploratory research that has not been addressed by prior research. In some cases the limitations of the database also lead to new research questions. For instance, a new research question arose where prior international research had the data to identify large brokerages, but this study did not have the brokerages' size-data and instead investigated brokerages that issued a large number of recommendations through their analysts. Exploratory research questions may therefore not have theoretical references that directly lead to or support the research question.

The analyst recommendations used in this study are viewed as information flows on a specified date. An event-study methodology was therefore followed and applied to measure various facets of investors' average reaction around the analysts' recommendations. Individual analysts and their activity were investigated over time using a longitudinal approach, while some cross-sectional tests were conducted according to consensus- and individual recommendation levels.

The next section describes the process that was followed to prepare the data for the investigation into the impact of analyst recommendations.

1.5 BACKGROUND TO THE DATA ANALYSIS

The Thomson Reuters Institutional Brokers' Estimates System (I/B/E/S) was used as the primary source of data for this dissertation, and the data was analysed using Microsoft Excel and Visual Basic for Applications (VBA).

1.5.1 Thomson Reuters Institutional Brokers' Estimates System

The I/B/E/S database initially contained only earnings estimates for companies listed on United States (US) exchanges in 1976, and the database was expanded over time to also include various other data types, such as recommendations from 29 October 1993 (Ljungqvist, Malloy and Marston, 2009). The I/B/E/S started including data for international companies in the early 1980s, and in 2014 covered more than 40 000 companies listed on exchanges in 70 different markets. Thomson Reuters (2014:1) claim that "Thomson Reuters estimates are the industry standard relied on by over 70 per cent of the top US and European asset managers and the most quoted by major media outlets".

While various custom-built data sources, databases and collections of newspaper articles were used in the early studies of analyst recommendations, the Thompson Reuters I/B/E/S is the predominant data source used when analysing analyst recommendations for most of the US and international studies from the mid-1990s (see Womack, 1996; Lin and McNichols, 1998). Two other frequently-mentioned databases used to analyse recommendations, outside of the I/B/E/S, are the Zack's database and the First Call database.

The various databases have been pitted against each other to compare recommendation timestamps and test the integrity of the respective databases. Hoechle, Schaub and Schmid (2012) tested I/B/E/S against the First Call database, and found that the US and Swiss I/B/E/S data was on average delayed by 0.73 and 0.60 trading days respectively for the 1994 to 2001 period, whereafter the delay was fixed. The tests by Hoechle *et al.* (2012) that investigated the difference in impact between the First Call announcement time and the I/B/E/S database's timestamps showed that the delay reduced the calculated impact of the recommendations on average. Any delay in the South African data can therefore be assumed to have reduced the reported average abnormal impact of recommendations, although this study does not test intra-day price movements but end-of-day price movements. It was also reported that the I/B/E/S database contained some data errors prior to 2007, but Thompson Reuters are reported to have fixed these errors on all downloads from 2007 onwards

(Ljungqvist *et al.*, 2009). The dataset used in this study used was extracted from I/B/E/S after 2007 and contains all alterations and fixes implemented by Thomson Reuters.

The Thomson Reuters I/B/E/S provided 37 433 lines of analyst recommendations and 'stops' on all shares listed on the JSE from 1993 to 2011. I/B/E/S keeps delisted companies' data and the analysis therefore does not suffer from survivorship bias. The recommendations were downloaded in the "I/B/E/S Detail File.xls" file, while the stops were downloaded in the "I/B/E/S Stop File.xls" file.

The database contained both local and international analysts' recommendations as well as information about the analysts and the brokerages employing them. The I/B/E/S database contains time-stamped recommendations on a day-to-day basis and automatically converts analyst recommendations into the traditional five-point scale ranging from strong buy to strong sell. The database excludes reiterations; meaning that recommendations which are confirmed or restated by an analyst after a certain period of time are excluded. An excerpt from the I/B/E/S Detail File is included in Appendix B. Although 37 433 lines of analyst recommendations and 'stops' in total were available for calculations, the amount of eligible data points used in each of the four chapters in this dissertation varied slightly depending on the history and recommendation categories needed for specific calculations and research questions. The reader should therefore expect sample sizes that differ to some extent across the chapters.

1.5.2 Behind the scenes: The methods of analysing the data

Microsoft Excel (Excel) and Visual Basic for Applications (VBA) were used for all tests and calculations as they allow for strict control of intricate data manipulation and analysis.

1.5.2.1 Measuring the returns

Daily total returns for all shares listed on the JSE from 1993 to 2011 were calculated using Thomson Reuters total-return price indices, thus including the effect of dividends on prices. The daily market-adjusted return (MAR) per share was calculated by subtracting the All Share Index's (ALSI) daily total return from each share's daily raw returns. See Section 2.3.2 for a detailed discussion on the calculation of MARs. The data was scrutinised for possible transcription errors using Excel (e.g. a price series containing a single "0" entry or a space between prices, or a decimal point in the wrong place for a single day), or calculation errors resulting from share splits or consolidations. No transcription or calculation errors were found in the dataset.

Following on Basiewicz and Auret's (2010) research that showed that the Fama and French three-factor model could be used for expected return estimations for JSE-listed companies, the next step was to implement the Fama and French (1992) model for the estimation of expected risk-adjusted

returns (RARs). The Fama and French model has also been widely used in international research when researching the impact of analyst recommendations (e.g. Womack, 1996; Barber *et al.*, 2001). The risk-adjusted returns were calculated using an approximate one calendar year history for each share for every day that every share was listed. See Section 2.3.2 for a detailed technical discussion on the calculation of RARs. Recommendations issued within the first year of a share's listing therefore did not have a RAR associated with it. Each regression used 1 040 data points in total from the single dependent variable and the three independent variables. This resulted in approximately 1.67 million regressions to cover the full list of shares for the 1993 to 2011 analysis period.

1.5.2.2 Consensus recommendations

A challenge in the analysis was to calculate the consensus recommendation per day per share. Because the I/B/E/S database only shows the date on which a recommendation was issued, a VBA-program was written to calculate the number of analysts who had an active recommendation per share, per day, and per five-point recommendation category. Each active recommendation was assigned an equal weight in the calculation of the consensus recommendation, similar to Barber *et al.* (2001).

For example: if three analysts respectively issued a buy (2), a hold (3) and a buy (2), the share's consensus recommendations would have been calculated as 2.33, meaning between a buy and a hold, but closer to a buy recommendation (calculated (2+3+2)/3 = 2.33). The limitations with Excel's memory usage forced the researcher to write another VBA-program that used arrays (data blocks) of approximately 24 million data points in total to convert all the recommendations into daily consensus recommendations. This analysis allowed an investigation into the number of analysts covering specific shares, the average- and consensus recommendations per share per day, as well as the construction of quintile portfolios of consensus recommendations and recently-upgraded/downgraded portfolios.

1.5.2.3 Leader-follower ratios

The leader-follower ratio (LFR) of each recommendation (see Chapter 4) was also calculated using a custom VBA-program. The LFR uses the number of trade days from a recommendation to the two closest preceding recommendations and the two closest subsequent recommendations made by other competing analysts before and after the recommendation in question was issued. This specific VBA-program needed to consider every eventuality and scenario that could occur in the issuance of recommendations. For instance, some shares with low coverage had a single analyst make more than one recommendation without activity from other analysts, while other recommendations did

not have two other analysts issuing recommendations after a recent listing. A recursive programming method was used to successfully negate all eventualities and permutations.

1.5.2.4 Statistical significance

It is important to note that the aggregate or average MAR, RAR, standardised volumes, leader-follower ratios and change in volatility are presented as results in this dissertation. These averages are calculated from parametric data and can therefore be tested for statistical significance in the light of the relevant research questions.

Various tests for the statistical significance of results' test statistics were calculated throughout this dissertation to investigate the various hypotheses and propositions. Coefficients and results marked with *, **, and *** are significant at the ten per cent, five per cent, and one per cent levels respectively. Table 5.3 does not allow enough width to add more than one character as indicator of significance, and *, #, and + were subsequently used to indicate if results were significant at the ten per cent, five per cent, and one per cent levels respectively. The various results sections indicate if a two-tailed test or an upper-tailed (upper one-sided) test was implemented.

All the aforementioned techniques and models had one mutual goal – to measure if analyst recommendations had an influence on the decisions and actions of investors and other security analysts.

1.5.3 'Correct' recommendations: a potential measurement mismatch

Investors, analysts and researchers may have different perspectives when measuring if a recommendation was 'correct' in predicting a share's future price movements when the recommendation was issued. The different questions are shown in Figure 1.1.

Depending on the context of the person judging a recommendation, the accuracy of a recommendation may be measured against a zero per cent return, inflation, the market index, or a risk-adjusted expected return. Taxes, commissions and trading costs can also be included. From Figure 1.1 it is suggested that this dissertation's measurement of the MAR and RAR following a recommendation are not the only means of judging the accuracy of a recommendation, and should be interpreted as not being an exhaustive application of all possible benchmarks and cost-structures.

Figure 1.1: Questions when judging if a recommendation was accurate

1.6 ORIENTATION OF THE STUDY

It is important to note that the 'PhD by article' structure was applied in this dissertation. The chapters therefore represent individual articles that each follows a unique line of thought, but related to the dissertation's main research question, and may contain some conceptual overlap from the introductory literature or literature from other articles. The chapters were furthermore written in a concise manner to only portray information essential to answering the key research questions and objectives. The University of Stellenbosch guidelines state that a minimum of three articles are required in this format, and this study comprises of four articles (in the form of chapters) as the main body of the dissertation.

The overlap between the chapters and the flow of the initial research questions that lead to each individual chapter are presented in Figure 1.2.

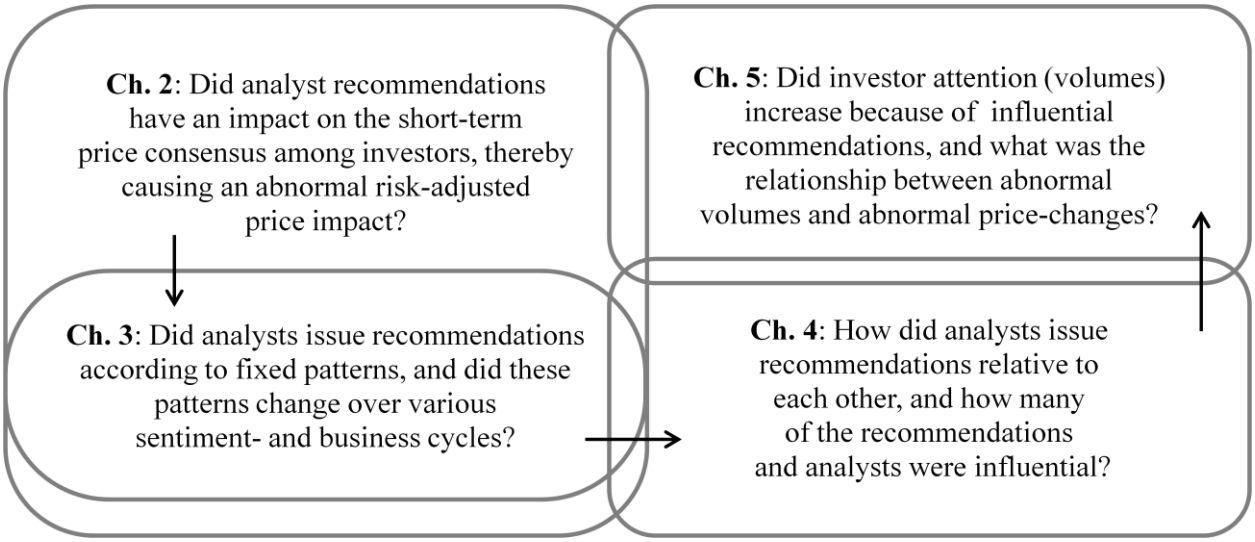

Figure 1.2: Overview of initial research questions and overlap of chapters

Figure 1.2 shows how the various chapters' main research questions developed sequentially as the literature was investigated and the preceding chapters' individual research questions addressed. For instance, after investigating if analyst recommendations did have an impact on the price-consensus among investors and often reading about a positive bias among analysts in Chapter 2's literature, the researcher questioned whether all the analysts used all five recommendations categories and if prevailing sentiment and business cycles influenced the analysts' recommendation preferences in Chapter 2. Chapter 3 is therefore presented as being part of Chapter 2 in Figure 1.2, but with a different research focus. Chapter 4 was 'born' from both Chapters 2 and 3, with the researcher asking (i) how the analysts acted relative to each other when evaluating them over time, (ii) if some analysts were more influential than others to cause the significant abnormal returns in Chapter 2, and (iii) if heightened analyst activity translated into an abnormal impact on prices. The last empirical chapter addressed the researcher's question concerning the link between investor attention and Chapters 3 and 4's analyst activity, comparing Chapter 4's influential analysts' recommendations to traded volumes, and in turn comparing the traded volumes to Chapter 2's abnormal price impacts.

In summary, Chapters 2 and 3 broadly investigates the analyst recommendations and their impact on price consensuses among investors, Chapters 3 and 4 the behaviour of analysts in issuing recommendations relative to each other, and Chapter 5 investigates investor attention (traded volumes) relative to (i) Chapter 2's revision categories and their respective abnormal price impacts and (ii) Chapter 4's influential recommendations.

The literature explaining the gaps in the current body of knowledge will be presented and discussed within the individual chapters. The results, answers to the research questions and the conclusions

reached are only discussed within each chapter after the foundation of literature and technical information has been presented. Section 6.2 presents the relationship of the findings to the two theories discussed in Sections 1.2 and 1.3, while Section 6.3 discusses the specific findings and the dissertation's unique contributions per chapter. The following part of this section gives a brief overview of the chapters to follow, stating the main focus of each chapter resulting from an opportunity presented by a gap in the current body of knowledge.

1.6.1 Chapter 2: The impact of analyst recommendations and revisions on the prices of JSE-listed companies

The relationship between new information and subsequent short-term price movements is analysed in Chapter 2.

The main objective is to determine if analyst recommendations did generate abnormal returns for shares listed on the JSE as a test of the semi-strong form of the efficient market hypothesis. The impact relative to the absolute level of the recommendation is further compared to the revision category in which the recommendation falls. The chapter tests if it is possible to build portfolios that yield positive abnormal returns by using analyst recommendations.

Only three other studies with very limited data and methodologies have been published on the impact of recommendations on JSE-listed shares before this study was commenced. While one study used month-end prices and consensus recommendations over only buy, hold, and sell categories for a three-year period, the other two used limited numbers of recommendations from only three and four brokerages respectively. Specific details of these articles are provided in Chapter 2.

Chapter 2 addresses the five main research questions that are listed below.

(i) Is the publication of a positive (negative) recommendation associated with a positive (negative) short-term abnormal return?

(ii) Are recommendation upgrades (downgrades) associated with positive (negative) short-term abnormal returns?

(iii) Are positive (negative) recommendation initiations associated with short-term positive (negative) abnormal returns? Is a positive recommendation which is dropped associated with negative short-term abnormal returns?

(iv) Is a strategy involving a long position in shares with the highest consensus recommendation and a short position in shares with the lowest consensus recommendation associated with positive abnormal returns?

(v) Is a strategy involving a long position in shares with the largest increase in consensus recommendation and a short position in shares with the largest decrease in consensus recommendation associated with positive abnormal returns?

1.6.2 Chapter 3: Analysts' recommendation preferences and the incidence of the execution of advised actions by investors

Chapter 3 aims to determine if specific behavioural tendencies were present among the group of analysts. More specifically, the objective is to measure if analysts on aggregate acted uniformly and honestly in the way they communicated to investors, and if investors reacted uniformly to analysts across analysts' activity levels (as measured by total number of recommendations issued per recommendation category) and brokerage affiliations. Periods of positive and negative sentiment are identified and the preferred recommendation patterns among analysts measured. The ability of individual analysts to frequently impact share prices was also examined.

While prior international research has linked activity levels to impact, no research has been conducted on this topic for JSE-listed shares. The investigation into the recommendation pattern distributions and the comparison of impact with brokerage activity (as measured by total number of recommendations issued by analysts working for the brokerage, per recommendation category) is a first both locally and internationally.

Chapter 3 addresses the five main research questions that are listed below.

(i) Did analysts prefer to rather issue hold recommendations than strong sell- or sell recommendations?

(ii) Do analysts issue more strong sell- and sell recommendations during times of negative sentiment and economic contraction than during times of positive sentiment and economic expansion?

(iii) Did all individual analysts issue recommendations across each of the five recommendation categories?

(iv) Did analysts who issued more recommendations have a higher frequency of causing an advised directional return impact than analysts who issued fewer recommendations?

(v) Did brokerages that issued a large number of recommendations through their analysts have an above-average abnormal impact on prices?

1.6.3 Chapter 4: Influential analyst recommendations and subsequent analyst activity

Chapter 4 researches general activity levels of analysts and the occurrence of recommendations that had a large abnormal impact. Analyst activity at both share and individual analyst level was

measured, meaning that the days between recommendations for a specific share was calculated (i.e. days between recommendations for only MTN), and that the days between recommendations for any share is calculated (i.e. days between any recommendation irrespective of whether it was issued for MTN, Sasol, or Remgro, etc.). The ability of analysts to issue recommendations that initiated increased activity among other analysts was investigated. The abnormal price impact of recommendations that preceded heightened activity among other competing analysts was also investigated to determine if the investors reacted to the recommendations that caused or preceded the increased activity.

The objectives of Chapter 4 have been researched internationally, but the leader-follower ratio has only been used by three prior international studies to measure analysts' relative activity. No research has addressed these objectives for JSE-listed shares. The chapter further offers methodological contributions concerning the presentation of the results.

Chapter 4 addresses the five main research questions that are listed below.

(i) Did analysts take less time to revise negative recommendations upward than revising positive recommendations downward?

(ii) Did an equal proportion of analysts issue influential recommendations that caused price movements greater than certain limits across all five recommendation categories?

(iii) Was the proportion of analysts who issued influential strong buy (buy) recommendations greater than the proportion of analysts who issued influential strong sell (sell) recommendations?

(iv) Did activity among other competing analysts increase after an influential recommendation was issued?

(v) Did recommendations that caused increased activity among other competing analysts have a significant abnormal price impact?

1.6.4 Chapter 5: The effect of new information on investor attention and post-recommendation price volatility

Chapter 5 investigates if investor attention (proxied by traded volume) increased with the release of new information in the form of analyst recommendations. Further research asking if specific positive or negative recommendation categories had a greater impact on investor attention than other recommendation categories is also presented, and the relationship between recommendations that caused a big abnormal price impact and investor attention is scrutinised. Chapter 5's last objective is to evaluate if recommendation revisions impacted the prevailing share price volatility levels.

The objectives of Chapter 5 have been researched internationally, but not for JSE-listed shares. The chapter offers methodological contributions concerning the presentation of the results and the linking of theoretical concepts.

Chapter 5 addresses seven main research questions, which are listed below.

(i) On average, were upgrades (downgrades) associated with abnormal traded volumes over the short term?

(ii) Were abnormal traded volumes over short window periods greater than abnormal traded volumes over longer window periods?

(iii) Did the revisions within the individual revision categories cause a significant increase in investor attention on aggregate?

(iv) Will investor attention peak on the day the recommendation is issued?

(v) Did recommendation revisions that caused large abnormal returns also cause increased investor attention (traded volumes)?

(vi) Did recommendations that caused above-average volume also produce significant abnormal returns?

(vii) Did price volatility increase or decrease after recommendations were issued?

1.6.5 Chapter 6: Conclusion

Chapter 6 presents a broad overview of the deductions made from the body of work presented in this dissertation. The overarching relevance of results to the two theoretical underpinnings of the study is also discussed. Chapter 6 lastly highlights the contributions of this dissertation per chapter.

Chapter 6 broadly shows that analyst recommendations coincided with and were followed by an abnormal reaction in prices, and that analysts issued their opinions using different patterns within the five possible recommendation categories. Not all analysts were able to issue recommendations with a large advised directional abnormal impact, and recommendations that had a large abnormal price impact generated some herding activity among the other analysts who covered the same shares. Investor attention also generally increased around the issuance of recommendation revisions.

The overall findings discussed in Chapter 6 also support the notion that the South African market is efficient to a certain extent, but also that some inefficiencies relating to behavioural aspects may have existed among investors who traded shares on the JSE.

1.6.6 Chapter 7: Limitations of the study and future research

Although the utmost care was given to pursue an unbiased and accurate methodology, some limitations did affect this study. For instance, the effect of transaction costs on results has not been considered, and investors should therefore expect to receive a lower return than the abnormal return impact in the results. The dissertation is concluded with a discussion of the 'blind-spots' and limitations of this body of work, and how it might be addressed in the future. Further research questions that might be investigated are also presented.

1.6.7 A map of the study

The research questions from the four empirical chapters (Chapters 2 to 5) were shortened or abbreviated and rewritten in a figure to form a 'game-board map' of the dissertation's flow. Each chapter's main research questions are abbreviated and listed clockwise from the "START" block. Note that research questions that were formulated as propositions only have a small coloured area, and that research questions that were formulated as hypotheses have a large coloured area to distinguish among the two types of research questions.

A symbolic 1981 Kruger Rand moves along to indicate which questions have been addressed and what questions are to follow. At the end of each chapter the colour of the specific research questions are updated to either green (notion supported), red (notion rejected) or grey (multiple conclusions) to reflect the related conclusions or deductions from the chapter. The initial 'game-board map' is contained in Figure 1.2.

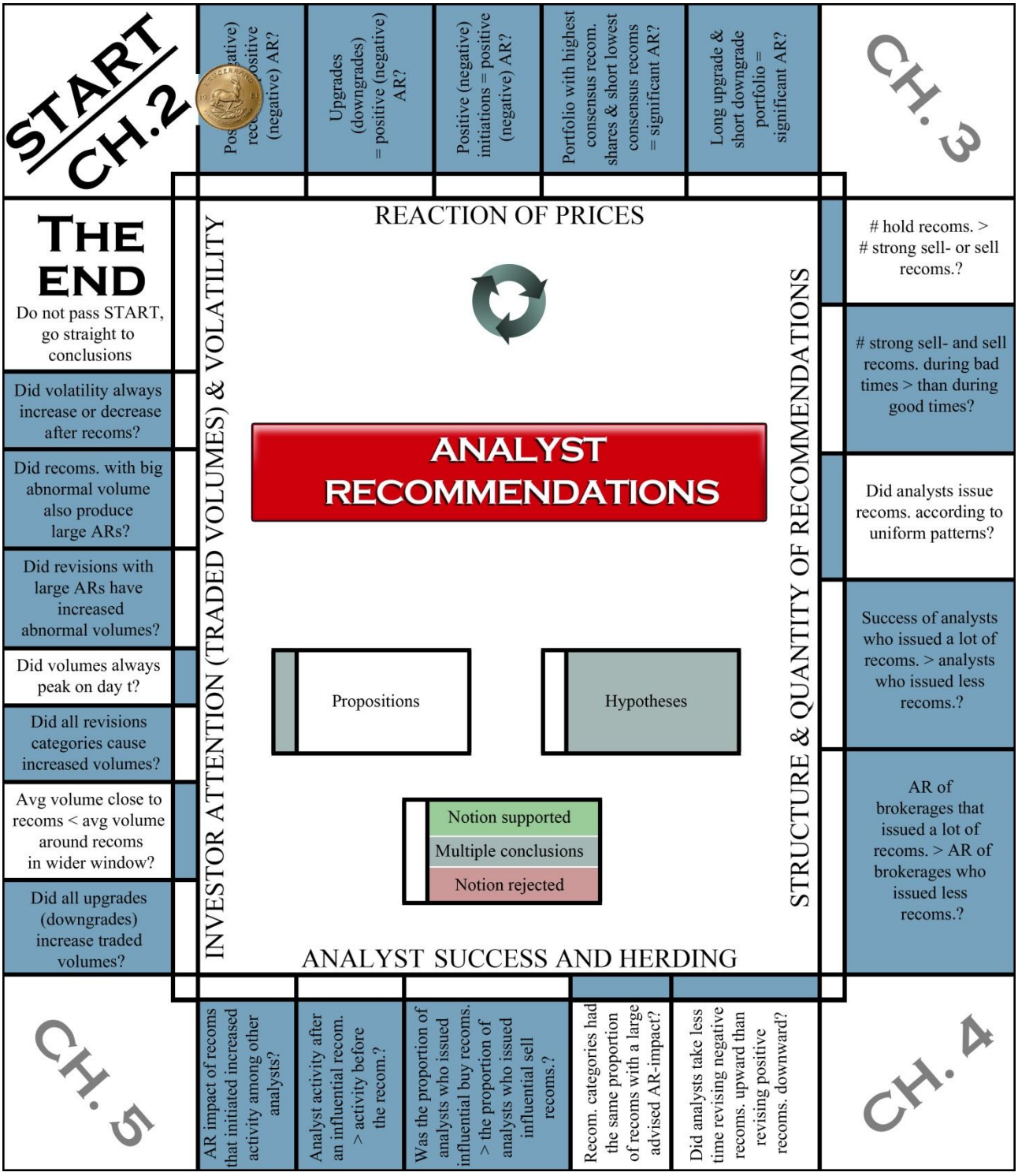

Figure 1.3: Game-board map of the study: Introduction

CHAPTER 2:

THE IMPACT OF ANALYST RECOMMENDATIONS AND REVISIONS ON THE PRICES OF JSE-LISTED COMPANIES[1]

2.1 INTRODUCTION

For decades security market analysts have provided the investment community with security recommendations. Analysts give their opinions about a specific company's future prospects by issuing recommendations. These recommendations generally range from strong buy to strong sell.

Any investment strategy based on recommendations which exhibit consistent outperformance violates the assumption that markets are efficient. The efficient market hypothesis (Fama, 1970) relates to the random walk theory (Fama, 1965) which states that share prices are mainly driven by news which, by definition, is unpredictable. Hence, changes in share prices cannot be predicted, and therefore must follow a random walk. This theory has two implications for the potential value of recommendations. Firstly, as long as analysts only use publicly-known information, the publication of a recommendation should not trigger significant share price movements unless analysts have superior insight in processing all facts and figures; and secondly, creating portfolios based on publicly-known recommendations should not be associated with positive abnormal returns over time, because the recommendation levels are publicly known and will therefore already be discounted in the share price when the recommendation is published.

A large body of literature deals with the short-term and long-term share price effects of the publication of recommendations. Stickel (1995), for example, showed that upgrades (downgrades) were associated with positive (negative) abnormal returns. In addition, Womack (1996) pointed out that the post-event drift after downgrades lasted for as long as six months. Barber *et al.* (2001) found that a portfolio consisting of highly favoured shares outperformed the least favoured shares. Jegadeesh *et al.* (2004) created portfolios on the basis of the quarterly change in the average recommendation, showing that recommendation changes were a better predictor of future share returns than recommendation levels.

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[1] This article was co-authored with Dirk F. Gerritsen (Utrecht University School of Economics, The Netherlands) and published in the *Investment Analysts Journal*. Minor changes have been applied to the format and wording to align the article to the dissertation, but no conceptual content or conclusions have been altered. Reference: Gerritsen, D.F. & Lötter, R. 2014. The impact of analyst recommendations and revisions on the prices of JSE-listed companies. *Investment Analysts Journal,* **80**, 45-57.

Evidence regarding the South African securities market is relatively scarce. As far as could be established, only three articles have been published on this topic (Bhana, 1990; Hall and Millard, 2002; Prayag and Van Rensburg, 2006). While the findings of these articles are generally in line with international conclusions, South African articles have several limitations. Firstly, the number of recommendation providers is limited in two studies. Bhana (1990) and Hall and Millard (2002) used recommendations issued by four companies and three companies, respectively. Secondly, Hall and Millard (2002) analysed recommendations for only 16 companies. Thirdly, the number of recommendations investigated is limited. Only 200 recommendations were considered in Bhana (1990) and 1 573 in Hall and Millard (2002). In contrast to the small sample sizes in South African studies, influential United States studies have used 21 387 recommendations (Stickel, 1995) and 378 326 recommendations respectively (Barber *et al.*, 2001). Fourthly, the sample period has been limited in both the Hall and Millard (2002) and Prayag and Van Rensburg (2006) studies as only three and five years respectively have been considered. Fifthly, Prayag and Van Rensburg (2006) relied on average monthly recommendation levels, and lastly, Prayag and Van Rensburg (2006) excluded delisted companies.

This study aims to overcome these limitations by using the internationally recognised Institutional Brokers' Estimate System, which contains daily published recommendations from both local and international analysts. Using 31 363 published recommendations for shares listed on the Johannesburg Stock Exchange (JSE), a comprehensive analysis is conducted of short-term returns after the publication of share recommendations over the period 1995 to 2011. In addition, portfolio strategies were used to consider potential abnormal returns beyond any initial share price effects.

This study investigated if the publication of optimistic (pessimistic) security recommendations by security analysts is associated with positive (negative) short-term abnormal returns. More specifically, this study investigated if upgrades (downgrades) are generally associated with significant positive (negative) abnormal returns. Furthermore, findings from two different portfolio strategies were used to evaluate if both the recommendation level and the recommendation revision contain value for investors on the JSE, and if both strategies should be taken into consideration when creating a share portfolio.

This study proceeds as follows: Section 2.2 describes the literature; in Section 2.3 the data, hypotheses and methodology are presented; Section 2.4 discusses the results; and Section 2.5 concludes the chapter.

2.2 LITERATURE

The literature regarding share returns after the publication of analyst recommendations is broadly divided into aspects related to short-term returns and portfolio strategies. Empirical findings based on both recommendation levels and revisions are discussed for both of these categories. The impact of the publication of a recommendation regardless of the previous level of recommendations was investigated in early studies. Research on recommendation revisions has generally been published as of the 1990s, while studies on portfolio strategies using recommendations emerged in the current century.

First the international evidence is examined, after which findings in a South African context are considered.

2.2.1 Short-term returns: recommendation levels

The effects of the publication of buy and sell recommendations on share price returns were considered in early studies. Diefenbach (1972) and Bidwell (1977) considered US recommendations published during the periods 1967 to 1969 and 1970 to 1973, respectively. Diefenbach (1972) documented that only 47 per cent of the shares receiving buy recommendations outperformed the S&P425 index. Bidwell (1977) reported similar findings as his study demonstrated that the risk-adjusted returns after a buy recommendation had been published were not significantly different from the S&P500 index returns. Only Diefenbach (1972) investigated stock returns after sell recommendations. As much as 74 per cent of shares underperformed relative to the benchmark after the publication of a sell recommendation.

As far as could be established, Bhana (1990) conducted the only study regarding the short-term price impact of the publication of buy and sell recommendations in South Africa. In Bhana's study a random sample was used, consisting of 100 buy and 100 sell recommendations from two stockbroking companies and two investment advisory companies over the period 1979 to 1988. Share returns were compiled on a weekly basis. Bhana (1990) found that, not only were buy recommendations preceded by 16 weeks of positive significant abnormal returns, but they were also followed by positive abnormal returns in both the week of the recommendation and the week following it. On the other hand, sell recommendations were preceded by four weeks with negative abnormal returns. Both the week of publication of the sell recommendation and the subsequent week exhibited a significant negative abnormal return. The conclusions of Bhana's study were partly in line with the international evidence of that time. However, the South African literature on this aspect has limitations: the recommendations were issued only by local analysts; a limited

number of analysts were used; only 200 recommendations were analysed; and the conclusions were based on weekly share prices.

2.2.2 Short-term returns: recommendation revisions

In addition to the level of the published recommendation, more recent literature considers the impact of the direction of recommendation revisions. Stickel (1995) studied recommendations on US shares published over the period 1988 to 1991. Upgrades to buy and strong buy recommendations were associated with significant market-adjusted gains for a period of up to 30 days after the publication. Significant negative abnormal returns for downgrades to hold, sell and strong sell were achieved until ten days after the publication of the recommendation. Both for upgrades and downgrades, recommendation revisions which skipped a rank (e.g. from hold to strong sell as opposed to sell to strong sell) had a greater short-term effect on the share price. Womack (1996) considered upgrades to the equivalent of strong buy, downgrades from strong buy, upgrades from strong sell, and downgrades to strong sell. Significant size-adjusted returns over the period (-1, 1) days around the publication were found for upgrades to strong buy, downgrades from strong buy, and downgrades to strong sell.

Next to recommendation revisions, also recommendation initiations (e.g. a recommendation by a broker for a certain share which does not have an outstanding recommendation by its broker) were studied. Furthermore, brokers can also decide to stop coverage of a share, referred to as ‘dropping a recommendation’. McNichols and O’Brien (1997) established that analysts would rather drop a recommendation than issue a sell recommendation, and that such an action might be favoured since analysts generally do not want to harm their relationship with the company in question. A drop might thus be interpreted as negative information when the existing recommendation is positive.

Short-term returns after recommendation revisions, initiations, and droppings of coverage on the South African market have not been studied before. Only Prayag and Van Rensburg (2006) have considered revisions in a South African context. However, their study used end-of-month average (also known as consensus) recommendation data. The exact date of a revision was therefore not known, and consequently short-term returns after revisions could not be computed.

2.2.3 Portfolio strategy: recommendation levels

It is of particular interest whether a strategy, in which positively recommended shares are bought and negatively recommended shares are (short-) sold, would be profitable. In this respect, Barber *et al.* (2001) created five different portfolios based on the average published recommendation and they rebalanced these portfolios on a daily basis. The first portfolio consisted of shares with the highest consensus rating, and so on. They established that a strategy in which an investor would buy (short-

sell) the most (least) recommended shares, yielded a significant abnormal annual return. A decreasing rebalancing frequency and a delay in acting to revisions decreased these abnormal returns. Barber *et al.* (2001) therefore suggested that investors should act quickly to capture returns from analyst revisions.

Two studies have been published on portfolio strategies based on share recommendations on the South African securities market. Hall and Millard (2002) analysed the returns of holding portfolios which were based on recommendations issued by three stockbroking companies for 16 shares during the period 1994 to 1998. The brokers were chosen based on the ranking of the 'Analyst of the year' awards. Three different portfolios (buy, hold and sell) were constructed based on the consensus recommendation. The portfolios were updated on a daily basis. Shares receiving an upgrade or downgrade were added to a portfolio on the next trading day. Hall and Millard (2002) concluded that both the buy and the hold portfolio outperformed the market as measured by both the JSE All Share Index and the Industrial Index, and that the sell portfolio underperformed the market. Prayag and Van Rensburg (2006) also focused on portfolio returns based on the published recommendations of South African stockbrokers, this time for the period 2000 to 2003. Prayag and Van Rensburg (2006) employed monthly consensus recommendations which were grouped into a buy, hold and sell portfolio. Portfolios were updated on a monthly basis. It was established that only the buy portfolio yielded significant positive abnormal returns.

The outperformance of buy portfolios in South Africa is in line with international findings (e.g. Womack, 1996; Barber *et al.*, 2001), although the South African research has limitations. South African articles used only recommendations issued by South African institutions. Hall and Millard (2002) introduced a selection bias by selecting only four analysts based on awards presented to the analysts. A limited number of shares were studied, and price returns rather than total returns were evaluated. Prayag and Van Rensburg (2006) excluded delisted companies. They also used month-end consensus recommendations, while Barber *et al.* (2001) suggested that a timely response to revisions is crucial for capturing potential share returns.

2.2.4 Portfolio strategy: recommendation revisions

Rather than anticipating the level of consensus recommendations, Jegadeesh *et al.* (2004) studied quarterly rebalanced portfolios based on recommendation changes. It was established that recommendation changes were a more robust predictor of future share returns than the level of the consensus recommendation. Barber, Lehavy and Trueman (2010) noted that the relatively infrequent rebalancing of Jegadeesh *et al.* (2004) (i.e. quarterly) might have contributed to the

conclusion that recommendation levels were not a robust return predictor. Barber *et al.* (2010) documented that both recommendation levels and changes were related to abnormal returns.

In the South African context, Prayag and Van Rensburg (2006) constructed portfolios based on the change in recommendation levels. Shares dropping from either the buy to the hold portfolio or from the hold to the sell portfolio exhibited negative abnormal returns in the next period. Other portfolios were constructed on the basis of reiterations, reappearances and discontinuations, but these portfolios generally had small sample sizes.

2.3 DATA AND METHODOLOGY

In this section, firstly, the dataset of the security recommendations is discussed; secondly, price data is considered; and finally, the procedures used to test the hypotheses are explained.

2.3.1 Recommendations

Analyst recommendations were retrieved from the Thomson Reuters Institutional Brokers' Estimate System (I/B/E/S). The benefit of this database compared to previously used data sources in South Africa is that it covers international as well as local research companies. I/B/E/S categorises published recommendations on a 5-point scale from 1 to 5, where 1 represents a strong buy, 2 a buy, 3 a hold, 4 a sell and 5 a strong sell. The I/B/E/S Detail File, which contains recommendations on a day-to-day basis, is used for the entire study. This study improves on Prayag and Van Rensburg's (2006) methodology by using daily recommendation data. Consequently, a consensus recommendation can be calculated on each day for every listed company. The database does not contain reiterations; in other words, recommendations which are merely confirmed after a certain period of time were excluded in this research.

The first recorded recommendation on I/B/E/S for a South African share dates from November 1993. The number of shares covered in 1994 is very modest and poses problems for quintile portfolio construction. For that reason, 1 January 1995 is treated as the starting day of our dataset for all descriptive statistics and hypothesis tests. I/B/E/S keeps delisted companies in their database and the analysis therefore does not suffer from survivorship bias. All recommendations published until 31 December 2011 are analysed. For the purpose of the calculation of abnormal returns (ARs) around recommendations, the underlying shares should have been listed on the JSE for at least one year in order to have been included in the analyses.

Table 2.1 provides the summary statistics.

Table 2.1: Summary statistics

Year	Average number of covered shares	Average number of analysts per company per day	Maximum number of analysts per company	Average recommendation level per day
1995	147	1.9	8	2.24
1996	220	2.7	9	2.50
1997	278	3.4	13	2.49
1998	300	3.6	14	2.34
1999	340	4.3	17	2.26
2000	306	4.2	17	2.35
2001	276	4.2	17	2.59
2002	249	3.9	15	2.58
2003	170	4.2	19	2.78
2004	147	3.9	15	2.81
2005	150	4.6	18	2.74
2006	162	4.3	18	2.72
2007	161	3.9	14	2.61
2008	175	3.9	18	2.49
2009	183	4.3	19	2.63
2010	176	4.7	25	2.60
2011	168	4.8	22	2.54

This table shows summary statistics for the sample on an annual basis. The second column shows the average number of shares covered by analysts in the respective year. Columns 3 and 4 depict respectively the average and the maximum number of analysts per covered company. Finally, the average recommendation level across all shares and all days is given in column 5. Note that 1 represents a strong buy recommendation and 5 a strong sell recommendation.

During 1995, the average daily number of shares covered by analysts was 147 and this number increased sharply to 340 in 1999. In the years thereafter the number fluctuated between 150 and 200 shares. This decline was in line with the decrease in the number of listed domestic companies as reported by the World Bank in the World Development Indicators (World Bank, 2014). The average number of analysts per company has increased since 1996. Each company is on average covered by four analysts, with a maximum of 25 analysts for some companies. The last column contains the consensus recommendation for each year, which is defined as the average of the consensus recommendation across all shares. The average recommendation is between buy and hold for the

whole period under analysis, on account of the fact that that buys and hold were the most frequently-used categories.

Table 2.2 shows the dynamics of the recommendations that were made in the sample. It provides a transition matrix in which the number of recommendation revisions across all categories is depicted. An 'Initiation' is the first recommendation published by a certain analyst for a certain share. A revision from 'Stop' means that an analyst who previously dropped coverage starts to cover the company again.

The bottom row shows the distribution of recommendations in the five different categories. In line with the average recommendation in Table 2.1, Table 2.2 shows that hold recommendations have been published most often, followed by strong buy and buy recommendations. Table 2.2 further illustrates that most recommendation revisions appear in the buy and hold segments.

Table 2.2: Recommendation revision matrix

From recommendation	To recommendation of					
	1	**2**	**3**	**4**	**5**	**Stop**
1		624	2 531	207	321	1388
2	648		2 614	277	79	1309
3	2 345	2 540		1 565	1 026	2 201
4	183	261	1 491		246	516
5	285	85	1 007	264		465
Stop	753	846	1 172	317	281	
Initiations	1 021	767	1 263	222	243	
Total	5 235	5 123	10 078	2 852	2 196	5 879

This table shows the number of recommendation changes for the full sample. Initiations, revisions and stopped recommendations are considered.

The sample contains 9 992 one-step changes, 7 447 two-step changes, 554 three-step changes and 606 four-step changes. The total number of revisions considered is 18 599. In addition to this, 5 879 cases are also considered in which a recommendation has been dropped, as well as 3 516 new recommendations (i.e. initiations). The total number of recommendations considered in this chapter is 31 363.

2.3.2 Price and return

The hypotheses were tested using two different forms of abnormal returns, i.e. (i) the market-adjusted returns were computed; and (ii) risk-adjusted abnormal returns were calculated.

Total return share price indices (including reinvested dividends) were obtained from Thomson Reuters Datastream. Share returns were computed on a daily basis using end-of-day prices ($P_{i,t}$) as defined in Equation 2.1. In this equation, $r_{i,t}$ denotes the raw return including dividends ($D_{i,t}$).

$$r_{i,t} = \frac{P_{i,t} + D_{i,t}}{P_{i,t-1}} - 1 \qquad ...(2.1)$$

The total return data for the FTSE/JSE All Share Index were collected. This index is considered as the market index, and also includes the effect of dividends. Although the total return index was only launched in 2003, index data has been restated to 1 July 1995 (see also Ward and Muller, 2012). For 1994 and the first six months of 1995, the JSE Overall Index was used as benchmark. The return for the market index ($r_{m,t}$) was calculated in a similar fashion to (1), except that the share price was replaced by the index level. The market-adjusted return (MAR) was then calculated as follows:

$$MAR_{i,t} = r_{i,t} - r_{m,t} \qquad ...(2.2)$$

For the calculation of the risk-adjusted return, first the daily excess return was calculated by subtracting the risk-free rate at day t ($r_{f,t}$) from the share return. As risk-free rate, the South African three-month Treasury Bill Rate was used.

$$R_{i,t} = r_{i,t} - r_{f,t} \qquad ...(2.3)$$

In line with international articles (e.g. Womack, 1996; Barber *et al.*, 2001), the Fama and French (1992) model for the estimation of expected returns was employed. Basiewicz and Auret (2010) recently showed that this three-factor model could be used for expected return estimation of JSE-listed companies. The model is set out in Equation 2.4:

$$E(R_{i,t}) = \alpha + \beta_{m_{i,t}} R_{m,t} + \beta_{SMB_{i,t}} SMB_t + \beta_{HML_{i,t}} HML_t \qquad ...(2.4)$$

where $E(R_{i,t}) = E(r_{i,t}) - r_{f,t}$ is the expected excess return for share *i* at day t. $R_{m,t} = r_{m,t} - r_{f,t}$ is the excess return on the market index.

'Small-minus-big' (SMB_t) and 'High-minus-low' (HML_t) are the additional Fama and French (1992) factors at day t. For this purpose, the smallest five per cent listed shares in terms of market capitalisation on a given day were excluded because smaller shares are more prone to extreme price swings, possibly due to the thin trading phenomenon. The factors were computed on a daily basis where SMB_t represents the return on a portfolio consisting of the 30 per cent smallest shares less the return on a portfolio consisting of the 30 per cent largest shares. HML_t is the return on a portfolio that is long in the 50 per cent shares with the highest earnings-price (E/P) ratio and short in the 50 per cent lowest E/P-shares. Originally, Fama and French (1992) proposed that book-to-market values should be used to derive the HML-factor. South African studies are followed in this study

(such as Van Rensburg and Robertson, 2003) by using the earnings-price ratio. All three factors were estimated on a daily basis with an estimation period of 260 trading days prior to the event day. Share returns of the last five trading days prior to a delisting were excluded since this period is sometimes characterised by large price swings (see Eisdorfer, 2008). Domestic factors were calculated based on South African shares because Griffin (2002) noted that a domestic model has a higher explanatory power than a world model.

Following Equation 2.3 and Equation 2.4, the risk-adjusted return (RAR) is estimated for share *i* on day t as follows:

$$\mathrm{RAR}_{i,t} = \mathrm{R}_{i,t} - \mathrm{E}(\mathrm{R}_{i,t}) \quad \ldots(2.5)$$

Cumulative abnormal returns (CARs) for a two-day event window are calculated as indicated by Equation 2.6 and Equation 2.7. Equation 2.6 documents the equation for the cumulative market-adjusted return (CMAR) and Equation 2.7 displays the equation for the cumulative risk-adjusted return.

$$\mathrm{CMAR}_{i} = \left(1 + \ \mathrm{MAR}_{i,0}\right) \times \left(1 + \ \mathrm{MAR}_{i,1}\right) - 1 \quad \ldots(2.6)$$

$$\mathrm{CRAR}_{i} = \left(1 + \ \mathrm{RAR}_{i,0}\right) \times \left(1 + \ \mathrm{RAR}_{i,1}\right) - 1 \quad \ldots(2.7)$$

As a last step, the cumulative abnormal returns (CARs) are averaged across all events.

2.3.3 Test procedures

Hypotheses were identified from the existing literature. The hypotheses are listed below, followed by a brief description of the test(s) related to the specific hypothesis.

Hypothesis 2.1: The publication of positive (negative) recommendations is associated with a positive (negative) short-term abnormal return on average.

In the first hypothesis, daily abnormal returns were analysed during a two-day window from the date of the publication of a recommendation. The publication can be any time during the day given the inclusion of international analysts in the dataset. Abnormal returns were thus analysed for both the day of the publication and the next trading day, to account for the possibility that recommendations are issued before the opening of the JSE or at the end of a trading day. This two-day event window also takes account of the possibility that recommendations were published after the daily close of the JSE for shares which are dual-listed on international exchanges. The new information, in this scenario, still has to be disseminated and will be reflected in the share price on the next day. For all 31 363 recommendations listed in Table 2.2, abnormal returns were calculated for this two-day period.

Hypothesis 2.2a: Recommendation upgrades (downgrades) are associated with positive (negative) short-term abnormal returns on average.

Hypothesis 2.2b: Positive (negative) recommendation initiations are associated with short-term positive (negative) abnormal returns on average.

Hypothesis 2.2c: A positive recommendation which is dropped is associated with negative short-term abnormal returns on average.

The second group of hypotheses considers recommendation initiations, revisions and stoppage of coverage respectively. Similar to the testing of the first hypothesis, abnormal returns were studied for a two-day period.

Hypothesis 2.3: A strategy involving a long position in shares with the highest consensus recommendation and a short position in shares with the lowest consensus recommendation is associated with positive abnormal returns.

In Hypothesis 2.3 the consensus recommendations were used to formulate a portfolio strategy. All recommendations for JSE-listed shares were evaluated on a daily basis. Whenever an analyst revised an existing recommendation, initiated the coverage, or dropped a recommendation, a new consensus recommendation for a share was calculated. Based on that, all shares were divided into five different equally-sized portfolios. Given the fact that certain average recommendations (such as a buy) occur more frequently than others, the five portfolios do not always contain exactly the same number of shares. Similar to Jegadeesh *et al.* (2004), the cut-offs for portfolios 1, 2, 3, and 4 were set equal to the 20^{th}, 40^{th}, 60^{th}, and 80^{th} percentiles respectively, of the distribution of the recommendations two days earlier. In other words, if the rebalancing day is called day t, then shares were rebalanced on the basis of the consensus recommendation on day t-2.

This delay of two trading days before a share is eligible for changing portfolios was incorporated to accommodate that, (i) some recommendations may be published at the end of a trading day; (ii) not all investors react promptly to the publication of new recommendations; and (iii) liquidity constraints for the smaller shares may be present on the JSE.

Portfolio 1 represents the shares with the most positive consensus recommendation (closer to recommendation level 1) and portfolio 5 contains shares on which the analysts are relatively bearish. In line with Prayag and Van Rensburg (2006), the daily returns of all portfolio constituents were equally weighted.

Hypothesis 2.4: A strategy involving a long position in shares with the largest increase in consensus recommendation and a short position in shares with the largest decrease in consensus recommendation is associated with positive abnormal returns.

Hypothesis 2.4 was also tested using a dynamic portfolio strategy to focus on recommendation revisions. The procedure was similar to that of the testing of Hypothesis 2.3, but in this case the portfolios were based on the increase in the consensus recommendation during a period of 21 trading days. Shares without a recommendation change in this period were excluded from this analysis. Portfolio 1 contains the shares which had experienced the largest increase in consensus recommendation and portfolio 5 contains the shares with the lowest increase in the consensus recommendations (i.e. the highest decrease). If the rebalancing day again is called day t, the rebalancing process depends on the change in consensus recommendation in the period (-22, -2).

For the portfolio strategies the market-adjusted returns are the difference between portfolio returns and market returns. The risk-adjusted return is calculated by regressing daily portfolio excess returns on daily market excess returns, SMB and HML factors. The intercept of this equation is the daily risk-adjusted return of a portfolio.

In line with Prayag and Van Rensburg (2006), statistical tests were performed for each hypothesis to determine whether the reported mean returns were significantly different from zero.

2.4 RESULTS

Following the four hypotheses listed above, this section is divided into four subsections, each discussing the results related to a particular hypothesis.

2.4.1 Short-term returns: recommendation levels

Table 2.3 illustrates the results of the publication of a new recommendation, regardless of the level of the preceding recommendation. The table presents both market-adjusted and risk-adjusted returns.

As can be observed from Table 2.3, strong buy and buy recommendations are associated with positive market-adjusted (risk-adjusted) abnormal returns of 0.18 per cent (0.16 per cent) and 0.12 per cent (0.12 per cent) on the day of the recommendation, respectively. The shares for which strong sell recommendations have been published exhibit a negative abnormal return of -0.23 per cent (-0.23 per cent). Furthermore, on the day after the recommendation has been published, statistically significant returns are found for strong buy, buy, and sell recommendations respectively.

Table 2.3: Average abnormal returns in the two-day period surrounding the publication of a recommendation

Rec.	Market-adjusted returns			Risk-adjusted returns			# of rec.
	(0)	(1)	CMAR (0,1)	(0)	(1)	CRAR (0,1)	
1	0.18%*** (4.07)	0.15%*** (3.63)	0.32%*** (5.49)	0.16%*** (3.80)	0.11%*** (2.95)	0.28%*** (4.81)	5 235
2	0.12%*** (3.26)	0.09%** (2.36)	0.21%*** (3.82)	0.12%*** (3.37)	0.09%** (2.48)	0.22%*** (4.01)	5 123
3	-0.02% (-0.76)	-0.02% (-0.85)	-0.04% (-1.11)	-0.04% (-1.41)	-0.04% (-1.34)	-0.08%* (-0.92)	10 078
4	-0.07% (-1.29)	-0.11%* (-1.85)	-0.19%** (-2.26)	-0.09% (-1.57)	-0.16%*** (-2.79)	-0.25%*** (-3.16)	2 852
5	-0.23%*** (-3.40)	-0.03% (-0.49)	-0.26%*** (-2.71)	-0.23%*** (-3.50)	-0.04% (-0.61)	-0.27%*** (-2.90)	2 196
Stop	-0.05% (-1.50)	0.20%** (2.47)	0.15%* (1.68)	-0.07%* (-1.90)	0.08% (-1.02)	0.01% (0.16)	5 879

This table presents the mean market-adjusted return and mean risk-adjusted returns on both the publication day and the day subsequent to the publication of a recommendation. Additionally the mean cumulative market-adjusted return (CMAR) and the mean cumulative risk-adjusted return (CRAR) are presented. Coefficients marked with asterisks are significant in a two-tailed test. The t-statistics are given in the second line of each cell. Each t-statistic pertains to the hypothesis that the respective average abnormal return is equal to zero.

The publication of a hold recommendation is associated with a negative cumulative risk-adjusted return of 0.08 per cent. This observation is in line with Malmendier and Shanthikumar (2007) who suggested that institutional investors perceive a hold recommendation to be a negative signal. Interestingly, after a recommendation has been dropped, the market-adjusted returns and risk-adjusted returns are not in line with each other. The market-adjusted return is positively significant on the day after the drop, while the risk-adjusted return is negative and significant on the day of the recommendation drop. The analysis of recommendation revisions in the next section can shed more light on this issue.

2.4.2 Short-term returns: recommendation revisions

The abnormal returns were studied further as shown in Table 2.4, in which the direction of the recommendation change is also included. Given the significance of the cumulative returns for both days as reported in Table 2.3, Table 2.4 depicts only two-day cumulative abnormal returns.

Table 2.4: Cumulative average abnormal returns surrounding revisions, initiations or stops

Panel A: Average market-adjusted returns

From recommendation	To recommendation of					
	1	2	3	4	5	Stop
1		-0.17% (-1.12)	-0.29%*** (-3.48)	0.49% (1.24)	-0.54%* (-1.84)	0.01% (0.07)
2	0.74%*** (4.07)		-0.08% (-1.00)	-0.45%* (-1.72)	0.26% (0.42)	0.15% (1.41)
3	0.27%*** (3.32)	0.37%*** (4.80)		-0.15% (-1.45)	-0.20% (-1.44)	0.00% (0.02)
4	0.30% (0.64)	0.25% (0.83)	0.06% (0.54)		0.21% (0.74)	0.96% (1.15)
5	0.79%*** (3.01)	1.28%*** (2.91)	0.40%*** (3.12)	-0.23% (-0.84)		0.36% (1.54)
Stop	0.37%** (2.51)	0.16% (1.20)	-0.05% (-0.49)	-0.46%* (-1.70)	-0.54%** (-2.27)	
Initiation	0.02% (0.13)	-0.07% (-0.46)	0.05% (0.43)	-0.29% (-1.09)	-0.46%** (-2.11)	

Panel B: Average risk-adjusted abnormal returns

From recommendation	To recommendation of					
	1	2	3	4	5	Stop
1		-0.08% (-0.55)	-0.38%*** (-4.64)	0.17% (0.45)	-0.42% (-1.50)	-0.07% (-0.60)
2	0.61%*** (3.49)		-0.13%* (-1.65)	-0.55%** (-2.24)	0.09% (0.15)	-0.10% (-1.05)
3	0.24%*** (3.04)	0.35%*** (4.66)		-0.21%** (-2.11)	-0.26%* (-1.90)	-0.10% (-1.17)
4	0.08% (0.16)	0.18% (0.69)	0.06% (0.59)		0.10% (0.37)	0.75% (0.90)
5	0.42%* (1.70)	1.41%*** (3.17)	0.40%*** (3.29)	-0.54%** (-2.05)		0.30% (1.32)
Stop	0.35%** (2.43)	0.22% (1.64)	-0.01% (-0.10)	-0.36% (-1.45)	-0.52%** (-2.35)	
Initiation	0.08% (0.62)	-0.10% (-0.74)	0.04% (0.43)	-0.01% (-0.04)	-0.30% (-1.41)	

This table shows the average cumulative abnormal return for the two-day interval around a recommendation change. Panel A depicts the average market-adjusted returns and Panel B describes the average risk-adjusted returns. The days considered are the day of the change and the day subsequent to the change. Coefficients marked with *, **, and *** are significant at the 10%, 5%, and 1% level for a two-tailed test. The t-statistics are given in the second line of each cell. Each t-statistic pertains to the null hypothesis that the mean abnormal return is equal to zero.

The general finding from Table 2.4 is that upgrades are generally associated with positive abnormal returns. The majority of the upgrades show statistically significant returns. The upgrade to sell from strong sell is noteworthy: although shares receive an upgrade they still experience a negative risk-adjusted return. Apparently a sell recommendation is perceived as bad news in most cases.

Downgrades are generally associated with share price decreases. This decrease is significant in five of the cases, using risk-adjusted returns as a measure of performance.

The returns after initiating previously dropped share recommendations are associated with the level of the recommendation: strong buy (strong sell) recommendations are associated with significant positive (negative) abnormal returns. Pure initiations are associated with significantly negative market-adjusted returns in the case of a strong sell recommendation. Ceasing coverage is not associated with significant abnormal returns. All in all, in the short run, the share returns are mostly in line with the change in recommendation. The next sections discuss whether analyst recommendations have value over a longer term as well.

2.4.3 Portfolio strategy: recommendation levels

In this section it will be considered whether a portfolio strategy based on consensus recommendations yields abnormal returns. Table 2.5 presents descriptive statistics regarding the portfolios.

Table 2.5: Descriptive statistics for the portfolios based on recommendation levels

	Portfolio				
	1	**2**	**3**	**4**	**5**
Average number of shares per quintile portfolio	53.5	36.7	45.0	40.6	34.2
Consensus recommendation	1.5	2.0	2.5	3.0	3.6

This table shows the average number of shares for five different portfolios which are formed on the basis of the consensus recommendation. The average consensus recommendation per portfolio is also shown.

The average number of shares per portfolio is not exactly equal to each other owing to the strong buy to strong sell measuring scale, often leaving several shares with the same consensus recommendation. The consensus recommendation is lower for each next portfolio. Note that portfolio 4, or the fourth quintile, has a consensus recommendation of 3, again supporting the hypothesis that analysts prefer to issue a positive recommendation rather than a negative one to protect the relationships with the analysts' information providers within the companies covered by the analysts.

Next, the results of the portfolio strategy are presented. Cumulative market-adjusted returns are calculated for each of the portfolios from a base value of 100. Figure 2.1 depicts the results of this strategy for each portfolio.

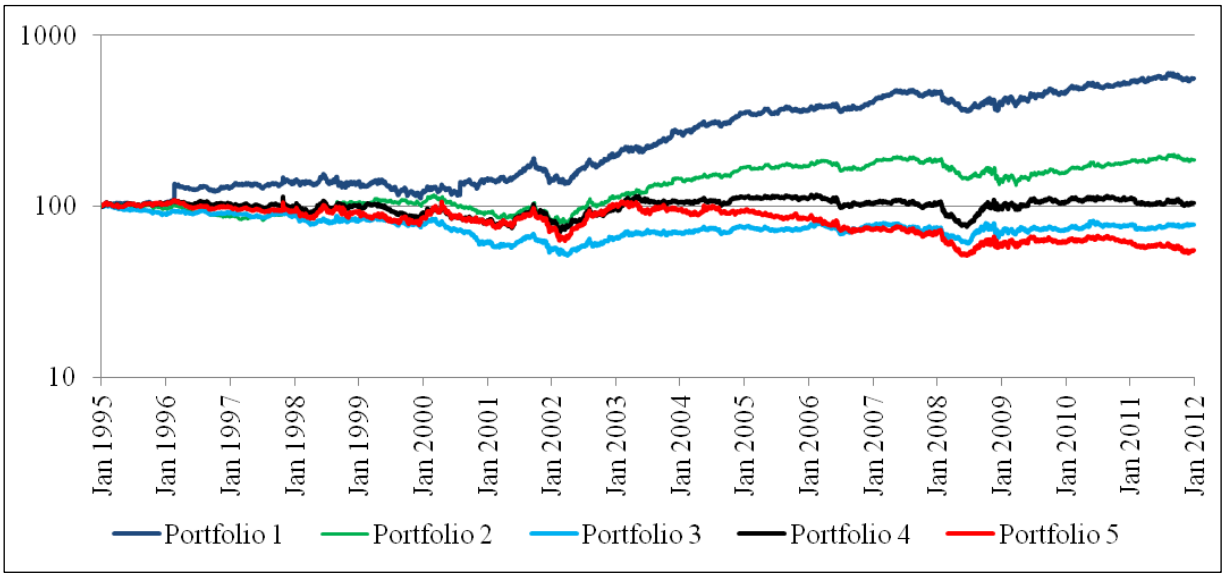

Figure 2.1: Consensus recommendation quintile portfolios

Figure 2.1 shows the cumulative market-adjusted returns from a strategy in which portfolio 1 contains the shares with the most favourable recommendations and portfolio 5 the least favourable recommendations, as defined by the recommendations published by security analysts in the I/B/E/S database.

Portfolio 1 contains the shares which have the most favourable recommendations while portfolio 5 contains shares eliciting pessimistic analyst viewpoints. Portfolios 1, 2 and 5 perform in sequential order, with portfolio 1 outperforming all other portfolios while portfolio 5 generates the lowest market-adjusted return. Portfolios 3 and 4 are not in sequence as portfolio 4 outperforms portfolio 3. Judging by Figure 2.1, buying shares with favourable consensus recommendations pays off, but it remains unclear whether 'shorting' shares (using derivatives to make a profit when prices fall) with the lowest consensus recommendation generates a positive abnormal return.

While Figure 2.1 provides a graphical explanation of the cumulative market-adjusted return of the different portfolios, Table 2.6 shows the statistical significance of the accompanying average daily abnormal returns for each portfolio. First the market-adjusted returns which were used in Figure 2.1 were evaluated. Only portfolio 1 generates significant abnormal returns measured by this approach. The bottom row of the table shows the results of a long/short portfolio in which a long position would be taken in portfolio 1 and a short position in portfolio 5.

Table 2.6: Average daily abnormal returns for portfolios based on recommendation levels

Portfolio	Mean market-adjusted return	Fama and French three-factor analysis				
		Intercept	Coefficients			R^2
			$r_m - r_f$	HML	SMB	
1	0.04%***	0.06%***	0.45***	-0.04**	0.00	0.37
	(2.88)	(5.36)	(41.83)	(-2.18)	(0.11)	
2	0.02%	0.03%***	0.52***	-0.03**	-0.03***	0.64
	(1.46)	(4.14)	(69.31)	(-2.33)	(-2.71)	
3	-0.00%	0.02%**	0.54***	-0.05***	-0.07***	0.68
	(-0.26)	(2.18)	(74.72)	(-3.81)	(-7.44)	
4	0.01%	0.01%	0.46***	0.01	0.04***	0.48
	(0.39)	(1.51)	(52.93)	(0.75)	(3.41)	
5	-0.01%	0.00%	0.43***	0.03*	0.08***	0.40
	(-0.58)	(-0.41)	(47.5)	(1.92)	(6.91)	
1 - 5	0.05%***	0.06%***	0.03**	-0.08***	-0.08***	0.01
	(4.06)	(4.89)	(2.14)	(-3.24)	(-4.81)	

This table shows both the market-adjusted and the Fama and French three-factor coefficients for the five different portfolios and for a portfolio which is long portfolio 1 and short portfolio 5. The portfolios are based on the consensus recommendation with portfolio 1 containing the 20 per cent shares with the highest consensus recommendation. Coefficients marked with asterisks are significant in a two-tailed test. The t-statistics are given in the second line of each cell. Each t-statistic pertains to the null hypothesis that the mean abnormal return is equal to zero.

This portfolio strategy would have yielded a statistically significant daily average market-adjusted return of 0.05 per cent. The analysis so far has not taken risk into consideration. Daily risk-adjusted returns have been computed by regressing the portfolio excess returns on the three Fama and French factors as per Equation 2.4. Portfolio performance is re-evaluated on the basis of these returns and these results are also depicted in Table 2.6.

The intercept from the regressions represents the alphas for the various portfolios. The alphas are in line with the reported average market-adjusted returns. Interestingly, the risk-adjusted alphas for portfolios 1, 2 and 3 are significantly positive. The coefficients with respect to the market risk premium were highly significant for all portfolios. The coefficients vary from 0.43 to 0.54 for the portfolios. The coefficients for the HML and SMB factors are small when compared to the market factor's coefficient. A possible explanation for this may be that the portfolios were dynamically constructed across all shares covered by analysts, and therefore shares from across the spectrum of

the HML- and SMB factors were equally likely to be included and excluded in each portfolio, effectively neutralising the contribution of those factors to the portfolios' performance.

A long/short strategy based on a long position in portfolio 1 and a short position in portfolio 5 would have yielded a daily risk-adjusted return of 0.06 per cent. This portfolio would have a relatively low level of market risk, given its factor loading on the market risk premium of only 0.03.

It can thus be concluded from both Figure 2.1 and Table 2.6 that a portfolio consisting of the 20 per cent of shares with the highest consensus recommendation outperformed the South African securities market over the period 1995 to 2011. A long/short strategy involving the purchase of portfolio 1 and the short-sale of portfolio 5 yields positive abnormal returns, while diminishing the level of market risk at the same time.

2.4.4 Portfolio strategy: recommendation revisions

Rather than composing portfolios based on the level of the consensus recommendation, portfolios in this section were constructed based on the recent change in consensus recommendations. Again five different (roughly) equally-sized portfolios were created, of which portfolio 1 contains the shares with the biggest positive change in consensus recommendation and portfolio 5 the largest negative change over a 21-day period. Table 2.7 depicts the descriptive statistics for each portfolio.

Table 2.7: Descriptive statistics for the portfolios based on recommendation revisions

	Portfolio				
	1	**2**	**3**	**4**	**5**
Average number of shares	14.5	15.8	15.2	14.9	16.8
Average recommendation increase	0.8	0.2	0.0	-0.2	-0.6

This table shows the average number of shares for five different portfolios which are formed on the basis of the change in the consensus recommendation in the period (-22, -2). The average change per portfolio is also shown in this table. Note that an increase in this case means that the consensus recommendation comes closer to the level of 1 which represents a strong buy recommendation.

As in the previous approach, the portfolios were not identical in size as several shares exhibited the same change in recommendation level. The recommendation increase is not symmetrical for the five portfolios, and exhibits some skewness explained by the decrease in the average recommendation level over time in Table 2.1. Note that only shares which experienced a consensus recommendation change in the period (-22, -2) were included in this analysis. Figure 2.2 graphically shows the outcome of this trading strategy.

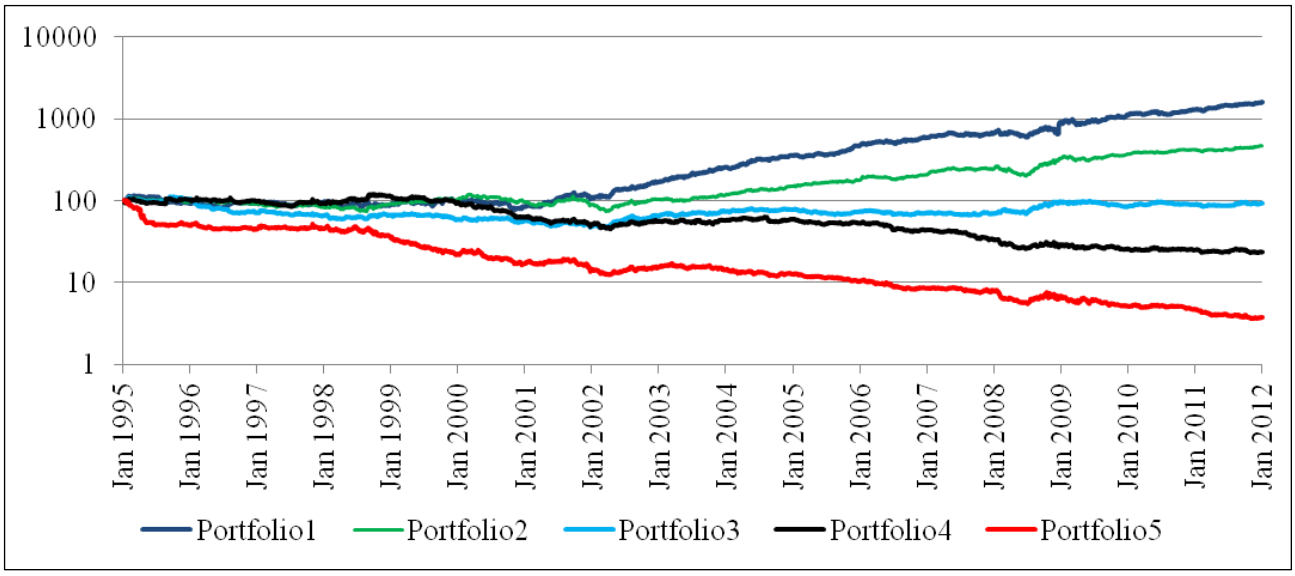

Figure 2.2: Recommendation revisions quintile portfolios

Figure 2.2 shows the cumulative market-adjusted returns from a strategy in which portfolio 1 (5) contains the shares with the most (least) positive change in the consensus analyst recommendation. Inclusion in a portfolio is based on the change in the recommendation in the period (-22, -2).

In this strategy portfolio 1 again outperforms all other portfolios. This time the results of portfolios 2 to 5 are also in line with expectations: the lower the increase in recommendation, the more negative the average market-adjusted return becomes. The findings depicted in Figure 2.2 suggest that a trading strategy based on the change of the consensus recommendation could be pursued to generate abnormal returns. Table 2.8 indicates the statistical significance of the findings.

Portfolios 1 and 2 show a daily significant market-adjusted outperformance of 0.07 per cent and 0.04 per cent, respectively. In contrast, portfolios 4 and 5 significantly underperform by roughly the same percentages. A long/short strategy in which investors would buy portfolio 1 and short-sell portfolio 5 yields a daily abnormal return of 0.14 per cent. Risk-adjusted returns are in line with the market-adjusted returns. A long/short strategy would have yielded a similar 0.14 per cent daily risk-adjusted return. The conclusions based on the market-adjusted figures are thus supported by the findings from the three-factor analyses.

The R^2 values for portfolios 1 and 5 are lower than the other portfolios' R^2 values in both Table 2.6 and Table 2.8. The low R^2 values for portfolios 1 and 5 indicate that the three regression factors did not entirely explain the collective performance of the shares expected by analysts to outperform or underperform considerably. The extremely positive and extremely negative sentiment among analysts with respect to the shares in portfolios 1 and 5, respectively, might have caused the share returns in these portfolios to be less related to traditional factors in the model.

Table 2.8: Average daily abnormal returns for portfolios based on recommendation revisions

Portfolio	Mean market-adjusted return	Fama-French three-factor analysis				
		Intercept	Coefficients			R^2
			$r_m - r_f$	HML	SMB	
1	0.07%***	0.09%***	0.53***	-0.05*	-0.04**	0.36
	(4.21)	(6.11)	(38.94)	(-1.92)	(-2.06)	
2	0.04%***	0.06%***	0.60***	-0.06***	-0.12***	0.60
	(3.12)	(5.77)	(60.24)	(-3.30)	(-9.11)	
3	0.00%	0.02%**	0.68***	-0.06***	-0.11***	0.65
	(0.11)	(2.03)	(67.65)	(-3.38)	(-8.66)	
4	-0.03%**	-0.01%	0.60***	-0.07***	-0.11***	0.53
	(-2.14)	(-0.52)	(52.91)	(-3.53)	(-7.40)	
5	-0.07%***	-0.05%***	0.45***	-0.05**	-0.00	0.32
	(-4.16)	(-3.90)	(36.68)	(-2.21)	(-0.27)	
1 - 5	0.14%***	0.14%***	0.08**	0.00	-0.03	0.01
	(7.86)	(7.67)	(4.41)	(0.06)	(-1.43)	

This table shows both the market-adjusted return and the Fama and French three-factor coefficients for the five different portfolios and for a long/short portfolio. The portfolios are based on the change in the consensus recommendation with portfolio 1 (5) containing the 20% shares with the most (least) positive change in the period (-22, -2). Coefficients marked with *, **, and *** are significant at the 10%, 5%, and 1% level for a two-tailed test. The t-statistics are given in the second line of each cell. Each t-statistic pertains to the hypothesis that the mean abnormal return is equal to zero.

2.5 CONCLUSIONS

In this chapter the relationship between security analyst recommendations and subsequent share returns was analysed for the South African share market. The existing South African research into analyst recommendations has suffered from several limitations, ranging from small sample sizes to relatively infrequent availability of recommendation data. To contribute to the body of knowledge on South African market efficiency in general and the value of analyst recommendations in particular, this study has been carried out using a large dataset of analyst recommendations made over the period 1995 to 2011on JSE-listed shares.

In semi-strong efficient markets all public information is already incorporated in share prices, and security analyst opinions should not make a difference. However, this study documents that both strong buy and buy recommendations are associated with significant abnormal returns on the day of

publication as well as the next day. Strong sell recommendations are associated with significant negative returns on the day of publication, while sell recommendations are associated with significant negative abnormal returns on the next day. Considering the direction of the recommendation revision, it is concluded that upgrades (downgrades) are generally associated with positive (negative) abnormal returns. Interestingly, an upgrade from strong sell to sell is still perceived to be bad news for shareholders even though it represents an upgrade. Given this short-term market impact, analysts apparently disseminate information which was unknown until the publication of the recommendation. This may be an indication that analysts have an edge in processing information and hence contribute to the efficiency of the South African share market.

Next, two different portfolio strategies were analysed in which five different portfolios were created. The composition of the portfolios in the first strategy was dependent on the level of the consensus recommendation on day t-2. Shares with the highest recommendation level showed significant outperformance, while the other portfolios exhibited mixed results. The second strategy considered portfolios based on the change in the recommendation level during the period (-22, -2). Five different portfolios were created, which were rebalanced on a daily basis. The two portfolios containing shares with the most positive recommendation revisions showed positive abnormal returns, while the two portfolios with negative changes exhibited negative abnormal returns.

It can be concluded that the magnitude of the recommendation revision (e.g. a four-step change versus a one-step change) matters more for future share returns than the absolute level of the recommendation. This price drift also indicates that the information content in analyst recommendations is not fully incorporated into share prices at the moment of publication. Transaction costs will lower the magnitude of the findings. Given that investors incur these costs at any transaction, the conclusion remains that investors should consider recommendations when they are facing investment decisions.

The research questions covered in Chapter 2 are updated in Figure 2.3, and the abbreviated research questions of the next chapter presented in the right-hand-side column.

Now that the impact of recommendations have been investigated, further tests regarding a possible positive bias among analysts, how analysts structured their individual recommendations across the various recommendation categories, and how the number of recommendations issued per analyst or brokerage influenced the impact of their recommendations are presented in Chapter 3.

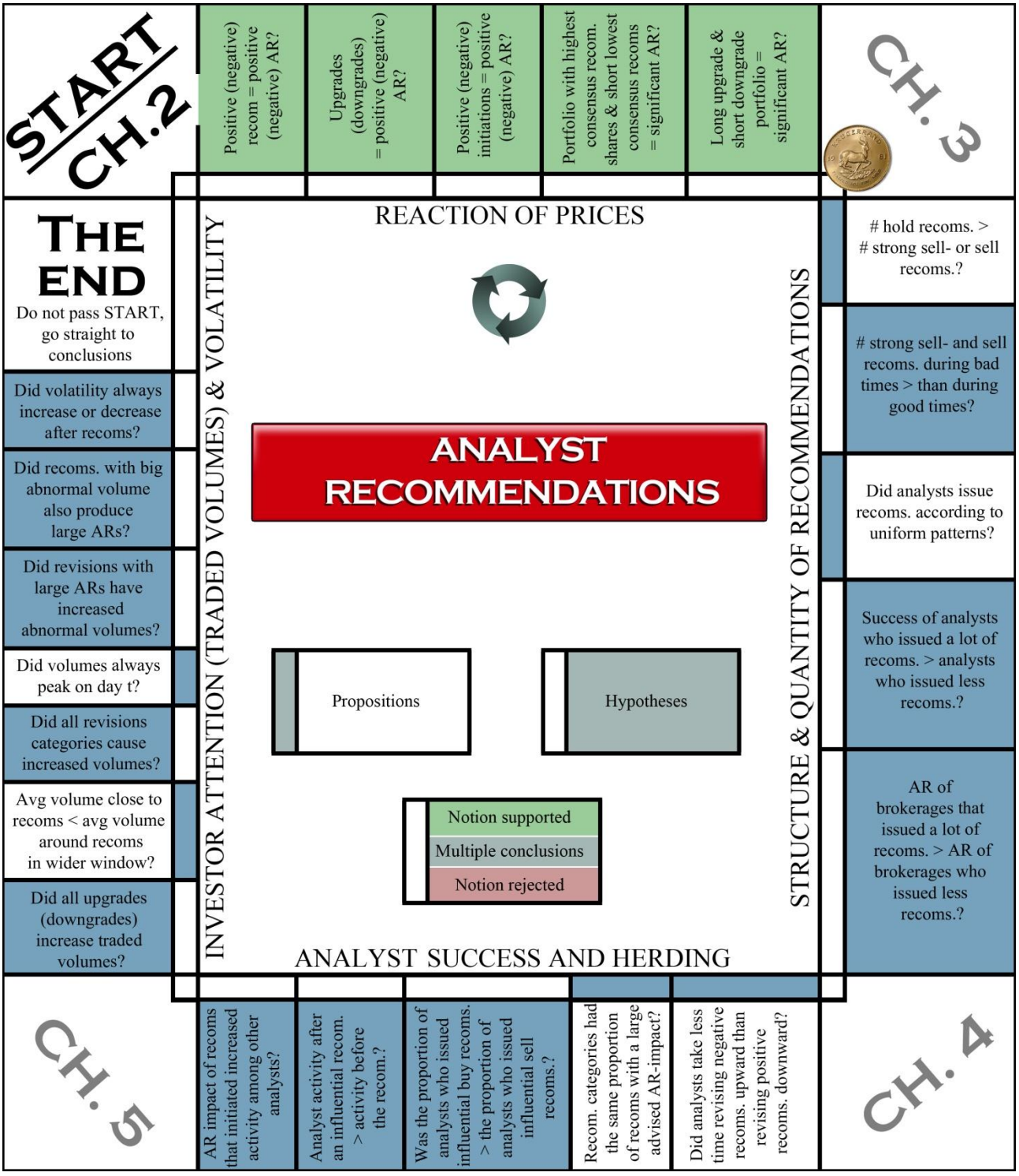

Figure 2.3: Game-board map of the study: Chapter 2

CHAPTER 3:

ANALYSTS' RECOMMENDATION PREFERENCES AND THE INCIDENCE OF THE EXECUTION OF ADVISED ACTIONS BY INVESTORS

3.1 INTRODUCTION

Financial analysts are trusted by different types of investors for dissemination and interpretation of information. The level of reliance on analyst recommendations is often related to the size and vocation of the investor; with smaller, non-professional investors having a tendency to over-rely on published recommendations (Malmendier and Shanthikumar, 2007). These smaller investors also generally trade more and benefit less from issued recommendations when compared to their larger counterparts; often generating an inferior level of returns when responding to upgrades and buy recommendations (Mikhail *et al.*, 2004).

Investors should ask a number of questions when presented with a range of different analysts' opinions, for example: 'Are some analysts better or more informed than other analysts? Will the analysts remain accurate and influential over time? Are the analysts' recommendations unbiased or influenced by conflicts of interest with regards to their employment or reimbursement?'

A body of research supports the theory that analyst recommendations can have a significant impact on prices and contain value for investors in developed markets (Stickel, 1995; Womack, 1996; Barber *et al*., 2001; Boni and Womack, 2006). The purpose of this chapter's research was to first identify whether analysts issuing recommendations for shares listed on the Johannesburg Stock Exchange (JSE) exhibit a similar reaction to the same information, and second if some analysts exhibit a tendency to be overly positive. The overall recommendation tendencies during periods of positive and negative sentiment were also investigated and the recommendation patterns amongst analysts were identified, as well as the ability of individual analysts to frequently elicit an abnormal impact on share prices. Lastly, the impact of recommendations issued by analysts affiliated to brokerage houses that issued the most recommendations was measured to test if the brokerage houses' activity influenced market reaction. It is assumed that brokerages with more recommendations have a greater market presence and that investors might trust these brokerages more than other less active brokerages.

The remainder of this chapter presents literature contextualising the individual analysts' recommendations relative to the factors that may influence their decision making processes. The methodology section describes the research process applied to measure the various analysts' recommendation reporting preferences and their impact on share prices. The results and discussions

are presented and the chapter concludes with a discussion of the implications of the results for investors relying on analyst recommendations.

3.2 LITERATURE REVIEW

Some of the factors influencing analysts' behaviour and the magnitude of their performance impact are discussed in this chapter; and company- and sector-specific factors that can influence the impact of recommendations are presented. Lastly, literature stating that analysts do not all have the same impact on share prices is considered.

3.2.1 Recommendations that impacted specific companies

While not all analyst recommendations are associated with significant abnormal returns, the impact of some recommendations is considerable. For instance, Kenneth Bruce wrote a report during 2007 for Merrill Lynch concerning a leading mortgage lender's ability to continue doing business during the credit crisis. The report caused a 13 per cent fall in the share price on the day the report was issued. Another example was Meredith Whitney's downgrade of Citigroup, after which a fall of 6.9 per cent in the share price, the CEO's resignation and death threats against her followed (Loh and Stulz, 2011). In both these cases the analyst's opinion was respected by market participants. Loh and Stulz suggested that significant abnormal returns following a recommendation revision revealed the analyst's ability to occasionally change the perception of a company, and bring forth a 'paradigm shift'. When a single analyst changes the consensus opinion by issuing an influential recommendation, the 'paradigm shift' normally initiates other analyst recommendation revisions and traded volume increases.

The fall of Enron at the end of 2001 demonstrated another element of analyst behaviour. Two months before Enron filed for bankruptcy in December 2001, seventeen analysts were reporting on the company. Of the seventeen analysts, ten issued strong buy recommendations, while another five issued buy recommendations. What makes this noteworthy is that these favourable recommendations were published during the period where a 50 per cent loss in market capitalisation occurred and large accounting losses were reported for Enron (Clarke *et al*., 2006). The positively biased analysts subsequently encouraged doubt amongst investors concerning analysts' credibility when investors became aware that analysts had negative information without adjusting their recommendations accordingly. The question remains as to what influences analysts to change their recommendations?

3.2.2 Factors influencing analysts' opinions

Analysts are reported to react to both financial and non-financial information, or alternatively to both qualitative and quantitative information. The release of annual financial data and upcoming mergers were identified as financial trigger events leading to recommendation revisions. That said, non-financial information is reported to often be of greater importance to sell-side analysts. Analysts were found to revise recommendations and change earnings forecasts after management teams released official statements, after adjustments in the strategic positioning of companies are made and after news affecting a company's operating environment is released (Kerl *et al*., 2012). Further evidence suggests that the size and market share of a company, a company's product offering and the business environment that the company is competing in are taken into account when analysts issue recommendations (Previts *et al*., 1994). Bradshaw (2002) found that analysts often justify negative recommendations by stating qualitative information, while positive recommendations are frequently based on more pragmatic valuations.

The relationship between the analysts and company management can also affect the views of analysts. Irvine (2001; 2004) noted that the types of information content released by analysts are influenced by the trading commissions they might receive from increased traded volumes. Furthermore, analysts are often provided with information by the management personnel of companies, and this close relationship can have an effect on the informational content of analyst publications. Clarke *et al.* (2006) noted that the analysts are often employed by investment banks that might own the shares within the coverage of the analyst. This scenario clearly puts the analysts in a position to favourably affect the banks' portfolios, creating a situation where "analysts are reluctant to issue negative recommendations because of the potential loss of future investment banking deals" (Clarke *et al.*, 2006:2).

3.2.3 The reaction of market participants to new information

After new information is produced by analysts, individual and institutional investors have to interpret the information and physically trade shares in order to change a share's price. Savor (2012) investigated the effect of information-based price movements versus price movements not associated with analyst reports or new financial data. Savor (2012) concluded that strong price movements that do not coincide with at least one credible analyst report to support the price change had strong price reversals, while price events accompanied by enough supporting information were normally followed by sustained price momentum. An analyst's report or various analysts' reports had to be aligned with the direction of the price change; otherwise a strong price reversal had a high probability of occurring. Loh and Stulz's (2011) US study revealed that more than one third of all

recommendations issued did not result in the advised price-change direction or 'sign', meaning a plus or minus to positive and negative recommendations respectively.

Any single analyst will naturally have difficulty issuing recommendations for all the listed shares. The consequence is specialisation and focus on certain industries or companies. Boni and Womack (2006) implemented an industry-centred research methodology for the 1996 to 2001 time period, and found that 53 out of 59 industries yielded significant one-month abnormal returns when shorting sell-recommended shares and purchasing buy-recommended shares. Boni and Womack (2006:1) also found that recommendation changes for shares covered by many analysts yielded substantially less returns than shares followed by fewer analysts. The conclusion reached was that "competition among analysts reduces the opportunity to profit". Analysts who can operate in a niche environment covering a lesser-known industry or small shares might have an advantage over analysts who cover well-known or favoured shares.

The bigger the company size and the depth of analyst coverage, the harder it is for an analyst to make an influential recommendation (Loh and Stulz, 2011). Loh and Stulz further identified that smaller shares, growth type shares, shares with high trade volume prior to the recommendation and shares with a large percentage of institutional ownership have a greater likelihood of attracting an influential recommendation. After the influential recommendations were issued, higher volatility and substantial changes in the consensus earnings forecasts were recognised.

3.2.4 Varying impact among different analysts

Stickel (1995) was one of the first propagators of the notion that some analysts may have a greater impact than others. The potential profitability of reacting to proven analysts' recommendations was later confirmed by Fang and Yasuda (2014). The content of other analyst's reports and the related impact of recommendations were studied by Asquith *et al.* (2005), who found that it is not just the recommendation that has an impact, but also the content of the accompanying reports.

Over and above the information content, the size of the brokerage house was identified by Barber, Lehavy and Trueman (2000) to have a significant impact. Large brokerage houses' buy recommendations annually outperformed those of small brokerage houses by three per cent market-adjusted. Conversely, the sell recommendations of smaller brokerages yielded an annual five per cent greater impact than those of the sell recommendations issued by larger houses. When measuring the persistence of brokerage houses' recommendations' impact on prices, Barber *et al.* (2000:3) also found no indication of ranking persistence among the preceding year's top-ranked houses, stating any such claims as "weak at best".

Analysts' price impact performance persistence was investigated by Mikhail *et al.* (2004). Strong evidence that influential analysts continued to issue recommendations with superior price impact was reported, and Mikhail *et al.* indicated that analysts receiving accolades in the press, called 'star analysts', increasingly outperformed other analysts with shorter positive track records as the analyst's historical track record of outperformance and period of being known as a 'star' became longer. Mikhail *et al.* (2004:69) subsequently tested whether the market reacted stronger to the outperforming analysts, and pointed out that the market did indeed "react more positively (negatively) to recommendation upgrades (downgrades) from higher-performing analysts".

3.2.5 Positive bias and impact

Studies on the impact of analyst recommendations in South Africa have only yielded insight into the distribution of buy, hold and sell recommendations, the impact of consensus recommendation levels and the average impact of recommendations over specific time periods.

Prayag and Van Rensburg (2006) researched the distribution of buy, hold and sell recommendations and the impact of recommendations. They considered the March 2000 to April 2003 period and grouped 5 282 consensus recommendations into month-end buy, hold and sell portfolios. The percentage of buys and holds were 38 per cent and 59 per cent respectively. The percentage of sell recommendations was only three per cent (consistent with Bidwell, 1977; Elton, Gruber and Grossman, 1986; Womack, 1996; Barber *et al.*, 2001; Hall and Millard, 2002).

Prayag and Van Rensburg (2006:7) confirmed previous international evidence suggesting that the sell recommendations have a low prevalence because analysts want to "stimulate share trades and cultivate relations with management". Analysts are thus inevitably influenced by their working relationships and the audience whom they know will see their reports.

Analysts who work at brokerages which mainly issue recommendations to retail clients are commonly more positive than those working at companies who do research for institutional and larger corporate clients (Cowen *et al.*, 2006). Again, the fee- and incentivisation structures were found to play a significant role in the degree of analyst-positivity portrayed through the recommendations and reports they issued.

Although the general impact of analyst recommendations for JSE-listed shares was confirmed by Hall and Millard (2002), Prayag and Van Rensburg (2006) and in Chapter 2, none of these studies provide in-depth details concerning the behavioural differences among the individual analysts in the way they issue recommendations, except for claims concerning an overall positive bias.

From the literature review, it is evident that analyst recommendations can generate abnormal returns, but that the impact of the various analysts' recommendations is not equal for all analysts and sectors covered. The analysts' behaviour is suggested to be influenced by their relationships and affiliations. Brokerage houses have been demonstrated to not be associated with recurring influential recommendations over time.

Research questions concerning the impact and behaviour of analysts were identified from the study of relevant literature. While research questions (i), (iii) and (iv) respectively flow from prior research or statements by Prayag and Van Rensburg (2006), Loh and Stulz (2011), and Barber, Lehavy and Trueman (2000), research questions (ii) and (iv) are exploratory in nature. The broad research questions are listed below.

(i) Are analysts inclined to issue overly-positive recommendations?

(ii) Would a tendency to issue overly positive recommendations also be present over periods of low business confidence and economic contraction?

(iii) How often do analysts issue recommendations that coincided with an advised directional abnormal price impact?

(iv) Does the activity level of an analyst play a role in the incidence of recommendations with abnormal return impact?

(v) To what extent does the total number of recommendations issued by a specific brokerage house, employing analysts, influence the impact of an analyst's recommendations?

The methodology section provides details concerning the analysis of the individual analysts and their respective impact on share prices.

3.3 DATA AND METHODOLOGY

While Chapter 2 did not incorporate 1993's and 1994's data due to data-restrictions for creating portfolios, the November 1993 to December 1994 period is included in this chapter. The number of initiations and revisions analysed in this chapter is 30 486.

Hypotheses and propositions were identified from the existing literature. The hypotheses and propositions are listed below, followed by a brief description of the test(s) related to the specific hypothesis or proposition.

Proposition 3.1: Analysts prefer to rather issue hold recommendations than strong sell- or sell recommendations.

Descriptive statistics per calendar year for 1993 to 2011 were calculated to measure the distribution of analyst recommendations and the recommendation preferences of the analysts over time. The

number of instances for each of the five-point recommendation categories was calculated over the full period 1993 to 2011 and per calendar year to prepare the data for tests that aimed to determine if a tendency existed among analysts to be overly-positive. The results were then presented as percentages of total recommendations per year (e.g. 25 per cent strong sells) to determine if issuance patterns persisted over time and through different market cycles. Correlations were calculated using these annual percentages to measure the analysts' preference for migrating between recommendation categories.

The recommendation categories were grouped as buys, holds and sells; and the percentage of total recommendations of each grouping calculated per calendar year. The correlations between buys and sells, buys and holds, and hold and sells were calculated over various periods. The correlations were calculated over the total period, years where buys decreased, years where sells decreased, years where buys increased and lastly, years where sells increased.

Hypothesis 3.2: Analysts issue more strong sell- and sell recommendations during times of negative sentiment and economic contraction than during times of positive sentiment and economic expansion.

The percentage of total recommendations for each of the five recommendation categories were calculated and split between periods of general 'business confidence' (economic expansion) and 'lack of confidence' (economic contraction) to measure if a possible general positive bias persisted among analysts over these periods. The Rand Merchant Bank (RMB) and Bureau for Economic Research's (BER) Business Confidence Index (BCI) was used as an indication of the periods where sentiment shifted from positive to negative (BER, 2014), while the *Business cycle phases of South Africa* report by the South African Reserve Bank (SARB) was used to indicate the business cycle phase that the listed companies found themselves in (SARB, 2014).

The BCI takes the 'business confidence' of respondents from the retail-, wholesale-, motor trade-, manufacturing-, building- and construction sectors into account and measures business confidence at the end of every quarter. The BCI is a leading indicator of the economic business cycle phases because sentiment is expected to change before it is reflected in the various sectors' reported performance numbers. The RMB/BER's BCI is therefore an appropriate and relevant indicator of sentiment for the majority of companies the analysts issued recommendations for, and the sentiment reflected by the level of the BCI is expected to coincide with sentiment changes among analysts. The BCI can range from zero to 100, with a level above 55 (below 45) normally viewed as positive sentiment (negative sentiment) (Kershof, 2000). For the purposes of this study, a BCI level above 60 (below 40) was used as an indication of positive sentiment (negative sentiment) to assure a

strong alignment of general sentiment across the respondents' various sectors. The start- and end dates of the business sentiment and economic growth phases, as applicable to the 1993 to 2011 sample period used in this study, are shown in Table 3.1's Panel A and Panel B respectively.

Table 3.1: Turning points signalling economic sentiment and growth phases (1993-2011)

Panel A: BCI turning points signalling economic sentiment

Negative sentiment			Positive sentiment		
Start	**End**	**Duration (days)**	**Start**	**End**	**Duration (days)**
1993/11/01	1994/03/31	150	1994/10/01	1995/06/30	272
1996/07/01	1996/09/30	91	1995/10/01	1995/12/31	91
1997/04/01	1999/12/31	1 004	2002/04/01	2002/12/31	274
2000/04/01	2001/09/30	547	2003/10/01	2007/12/31	1 552
2008/07/01	2009/12/31	548			
2010/04/01	2010/06/30	90			
2011/07/01	2011/12/31	183			

Source: Adapted from BER, 2014. See Appendix C.

Panel B: Economic turning points signalling contraction or expansion

Contraction			Expansion		
Start	**End**	**Duration (days)**	**Start**	**End**	**Duration (days)**
			1993/06/01	1996/11/30	1 125
1996/12/01	1999/08/31	1 003	1999/09/01	2007/11/31	3 012
2007/12/01	2009/08/31	639	2009/09/01	2011/12/31	851

Source: Adapted from SARB, 2014.

The total number of recommendations and the number of recommendations per recommendation category were counted for each positive and negative sentiment period and for the total period. The percentage incidence of each recommendation category was then calculated within the relevant sentiment's timeframe. The results were further summarised by grouping strong buys and buys together under 'Buys', and sells and strong sells under 'Sells'. The minimum, maximum and weighted average of each recommendation category's percentage incidence per sentiment-period were lastly calculated for the positive and negative periods respectively in order to measure if analysts communicated an overly-positive sentiment. The z-test for proportions was conducted to measure if the various recommendation categories' incidence changed significantly.

Proposition 3.3: Analysts do not issue recommendations according to uniform patterns.

The prevalence of analysts' recommendation patterns and preferences were identified and measured. The number of analysts who issued recommendations per recommendation pattern, the instances of recommendations per recommendation category and the average analyst activity per pattern were calculated. The results were then ranked according to average analyst activity per pattern to find the patterns with the most active analysts.

Hypothesis 3.4: Analysts who issue more recommendations have a higher frequency of an advised return impact than analysts who issue fewer recommendations.

The short-term market-adjusted return (MAR) and risk-adjusted return (RAR) impact of each individual analyst's recommendations were calculated, and the advised impact frequency (AIF) of each analyst was determined per individual recommendation category. The AIF represents an individual analyst's percentage recommendations that were associated with an advised or expected MAR and RAR. Analysts would desire a positive reaction in prices after issuing a buy or strong buy, i.e. three positive AR reactions out of five strong buy recommendations would result in a 60 per cent AIF for strong buys. Similarly, an analyst who issued sell recommendations that often produced an AR below zero would have a high AIF for the sell categories. Note that the magnitude of the abnormal impact did not influence the AIF calculation because only the sign of the AR counted.

The average AIFs per recommendation category were then calculated and compared to various 'minimum-recommendations' thresholds in graphical format (see Figure 3.3). The average AIFs per recommendation category were calculated as the average of the individual analysts' AIFs, implying an equal weighting to analysts irrespective of their total number of recommendations issued, as long as their total recommendations issued were above the threshold. Hold recommendations were assumed to be treated as negative signals by investors, and the results should be interpreted as if the hold recommendation advised a negative response.

To test if analysts who issued more recommendations had a higher AIF than analysts who issued fewer recommendations, the sample of individual analysts was split into two groups and their average MAR AIFs and RAR AIFs computed. The AIFs of the analysts who issued more than 50 revisions in total ($A>50$) were calculated and the AIFs of the analysts who issued less than 50 revisions in total ($A<50$) were subtracted. The difference in MAR AIF and RAR AIF for both day t and day t+1 were calculated, and the z-test for proportions was used to calculate the differences.

The size of the brokerage house was identified by Barber *et al.* (2000) to have a significant impact on the magnitude of an analyst's recommendations' impact on prices in the US. The sizes of the

brokerages in this study's sample were not provided by I/B/E/S, and the total number of recommendations issued from each brokerage was therefore used in Hypothesis 3.5 as a proxy for brokerage size under the assumption that large brokerages would issue more recommendations over time.

Hypothesis 3.5: Brokerages that issue many recommendations through their analysts have an above-average abnormal impact on prices.

All combinations between brokerage houses employing the analysts and the individual analysts themselves were identified, and the total recommendations issued from each brokerage calculated. The active brokerage houses' differential impact on performance was measured by calculating the average abnormal impact of each individual brokerage house and subtracting the overall average impact per recommendation category. An active brokerage house was defined as having issued more than 250 recommendations in total over the entire period, and only recommendation categories containing more than 50 recommendation-instances were considered.

3.4 RESULTS AND DISCUSSION

The results of the analysis of JSE focused equity analysts and the impact of their recommendations on the JSE-listed shares are presented and discussed.

The equity analysts and brokerage houses amounted to 901 and 105 respectively, with 1 109 unique combinations identified as analysts moved between brokerage houses. From within each brokerage house, an average of 357 recommendations and stops were issued over the sample period, and ten of the brokerages issued more than 1 000 recommendations. Forty-five brokerage houses issued recommendations without accrediting an analyst. The distribution of all recommendations per calendar year is presented in Figure 3.1.

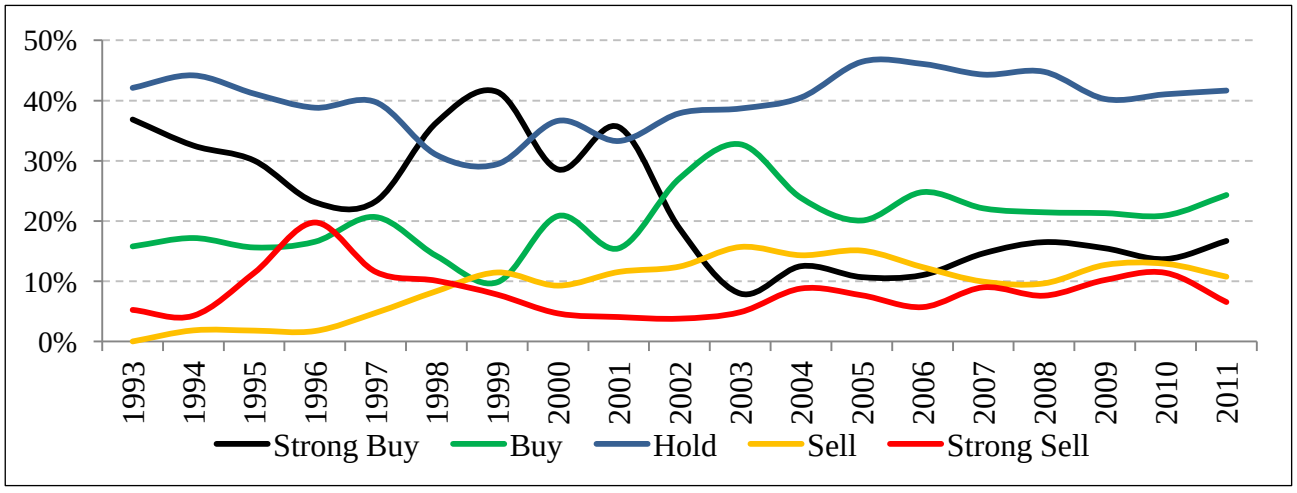

Figure 3.1: Distribution of recommendations (1993-2011)

The overall 1993 to 2011 distribution among each year's proportion of strong buy-, buy-, hold-, sell- and strong sell recommendations were 24.6 per cent, 19.5 per cent, 37.4 per cent, 10.6 per cent and 7.8 per cent respectively. When differentiating between positive and negative recommendations, the sample consisted of 44.2 per cent positive recommendations versus only 18.4 per cent sell and strong sell recommendations on average.

Analysts migrated between strong buy- and buy recommendations over the period, producing a clear inverse movement between the two recommendation categories in Figure 3.1. The correlation between the strong buy category's annual percentage incidence and buy category's annual percentage incidence was highly significant at -0.84***, showing that the active groups of analysts issued recommendations in one of the two categories but not both, also indicative of 'herding' among the analysts (Scharfstein and Stein, 1990; Trueman, 1994; Jegadeesh and Kim, 2010).

Positive recommendations reached a level of 30.8 per cent during 2005, i.e. 13.4 per cent below the average. The decrease in positive recommendations did not have the expected inverse effect on negative recommendations, but rather an increase in hold recommendations. Negative recommendations only peaked at 24.3 per cent during 2010, five years after the low-point for positive recommendations. The subsequent seven per cent fall in negative recommendations to 17.3 per cent during 2011 coincided with a seven per cent rise in positive recommendations. The correlation analysis indicating the analysts' preferred recommendation categories to migrate to during different market cycles is presented in Table 3.2.

Table 3.2: Correlation of recommendation category increases and decreases per calendar year

Control period (Scenario)	n	Buys vs. Sells	Buys vs. Holds	Holds vs. Sells
Total period	18	-0.60*** (-2.97)	-0.44 (-1.94)	-0.46* (-2.09)
(a) Decrease in Buys	10	-0.30 (-0.89)	-0.13 (-0.37)	-0.91** (-6.09)
(b) Decrease in Sells	6	-0.74* (-2.19)	-0.85** (-3.25)	0.28 (0.57)
(c) Increase in Buys	8	-0.49 (-1.37)	-0.24 (-0.61)	-0.73** (-2.61)
(d) Increase in Sells	12	-0.41 (-1.43)	-0.73** (-3.37)	-0.32 (-1.07)

Correlations marked with asterisks are significantly different from zero for a two-tailed test.

Over the total period, the -0.60 correlation indicated that analysts predominantly fluctuated between positive and negative recommendation categories, while the tendency to move between sells and holds was only weakly statistically significant. When comparing the years when buys decreased (Scenario a) to the years where sells decreased (Scenario b), the migration towards hold recommendations from the non-controlled recommendation category was different for the two scenarios. Hold recommendations were weakly positively correlated to decreasing sell recommendations in Scenario (b), indicating that the number of holds decreased as the number of sells decreased and that positive recommendations increased. On the contrary, during periods where buys decreased (Scenario a), holds increased slightly while it decreased in Scenario (b). This phenomenon might have been produced by analysts who issued hold recommendations rather than sells during periods of negative sentiment, and then subsequently changed to positive recommendations from both buys and sells when positive sentiment re-entered the market.

Scenarios (a) and (b), where the control recommendation category decreased, produced a stronger inverse relationship between the non-controlled variables than in Scenarios (c) and (d). When controlling for calendar years where buys or sells increased or decreased, the two non-controlled recommendation categories showed strong negative correlation instead of increasing (decreasing) together while the controlled category decreased (increased). This result further shows analysts' preference to rather issue holds than sells because the two non-controlled variables should rise and fall in tandem if buys, holds and sells were equally likely. This evidence supports Proposition 3.1's notion that analysts prefer to issue hold recommendations rather than sell recommendations.

The incidence percentages of the various recommendation categories over different positive and negative business confidence periods and economic growth-phases are displayed in Table 3.3 and Table 3.4 respectively.

A few patterns emerge when comparing Table 3.3 and Table 3.4. The individual SARB business cycle periods lasted much longer on average than the sentiment indicator's individual periods. Irrespective of the sentiment- or economic growth cycle direction, strong buys occurred more frequently than buys before 2002, while analysts issued more buys than strong buys from 2002 onwards. Strong sells also generally occurred more often before 1997 than after 1997, except for the short 180-day BCI-window right at the start of the sample period. The hold category was fairly stable over all of the event windows in the two tables, and was five per cent to six per cent more on average during economic expansion and positive sentiment than during negative cycles.

Table 3.3: Sentiment of analysts vs. business confidence

Negative sentiment (BCI < 40)				Recommendations category					Summary		
Start	**End**	**Days**	**Recommendations (n)**	**Strong buy**	**Buy**	**Hold**	**Sell**	**Strong sell**	**Buys**	**Holds**	**Sells**
1993/11/01	1994/03/31	150	107	34.6%	5.6%	54.2%	2.8%	2.8%	40.2%	54.2%	5.6%
1996/07/01	1996/09/30	91	148	27.7%	7.4%	44.6%	2.7%	17.6%	35.1%	44.6%	20.3%
1997/04/01	1999/12/31	1 004	9 574	36.1%	13.6%	31.9%	9.1%	9.3%	49.7%	31.9%	18.5%
2000/04/01	2001/09/30	547	3 508	33.5%	17.6%	34.8%	9.6%	4.5%	51.1%	34.8%	14.1%
2008/07/01	2009/12/31	548	2 101	15.8%	21.3%	41.3%	11.8%	9.8%	37.1%	41.3%	21.6%
2010/04/01	2010/06/30	90	329	10.6%	18.5%	43.2%	14.9%	12.8%	29.2%	43.2%	27.7%
2011/07/01	2011/12/31	183	1 160	19.0%	25.3%	38.4%	12.1%	5.3%	44.2%	38.4%	17.3%
			Minimum:	10.6%	5.6%	31.9%	2.7%	2.8%	29.2%	31.9%	5.6%
			Maximum:	36.1%	25.3%	54.2%	14.9%	17.6%	51.1%	54.2%	27.7%
			Weighted average:	31.3%	16.1%	34.6%	9.8%	8.2%	47.5%	34.6%	18.0%

Positive sentiment (BCI > 60)				Recommendations category					Summary		
Start	**End**	**Days**	**Recommendations (n)**	**Strong buy**	**Buy**	**Hold**	**Sell**	**Strong sell**	**Buys**	**Holds**	**Sells**
1994/10/01	1995/06/30	272	22	31.8%	4.5%	40.9%	4.5%	18.2%	36.4%	40.9%	22.7%
1995/10/01	1995/12/31	91	256	28.9%	17.2%	40.2%	1.6%	12.1%	46.1%	40.2%	13.7%
2002/04/01	2002/12/31	274	1 740	18.1%	27.8%	38.8%	11.5%	3.8%	45.9%	38.8%	15.3%
2003/10/01	2007/12/31	1 552	4 966	12.0%	23.1%	44.4%	13.0%	7.5%	35.1%	44.4%	20.5%
			Minimum:	12.0%	4.5%	38.8%	1.6%	3.8%	35.1%	38.8%	13.7%
			Maximum:	31.8%	27.8%	44.4%	13.0%	18.2%	46.1%	44.4%	22.7%
			Weighted average:	14.2%	24.0%	42.8%	12.2%	6.8%	38.2%	42.8%	19.0%

Table 3.4: Sentiment of analysts vs. economic cycles

Negative cycle - contraction				Recommendation category						Summary		
Start	**End**	**Days**	**Recommendations (n)**	**Strong buy**	**Buy**	**Hold**	**Sell**	**Strong sell**		**Buys**	**Holds**	**Sells**
1996/12/01	1999/08/31	1 003	8 965	35.6%	13.9%	32.3%	8.5%	9.7%		49.5%	32.3%	18.2%
2007/12/01	2009/08/31	639	2 242	16.9%	21.3%	42.4%	10.8%	8.6%		38.2%	42.4%	19.4%
			Minimum:	16.9%	13.9%	32.3%	8.5%	8.6%		38.2%	32.3%	18.2%
			Maximum:	35.6%	21.3%	42.4%	10.8%	9.7%		49.5%	42.4%	19.4%
			Weighted average:	31.9%	15.4%	34.3%	8.9%	9.5%		47.3%	34.3%	18.4%
Positive cycle - expansion				**Recommendation category**						**Summary**		
Start	**End**	**Days**	**Recommendations (n)**	**Strong buy**	**Buy**	**Hold**	**Sell**	**Strong sell**		**Buys**	**Holds**	**Sells**
1993/11/01	1996/11/30	1 125	1 257	26.4%	16.2%	40.0%	1.8%	15.5%		42.6%	40.0%	17.3%
1999/09/01	2007/11/30	3 012	14 547	21.2%	22.3%	38.6%	12.2%	5.7%		43.5%	38.6%	17.8%
2009/09/01	2011/12/31	851	3 475	14.7%	22.7%	41.6%	12.1%	9.0%		37.4%	41.6%	21.1%
			Minimum:	14.7%	16.2%	38.6%	1.8%	5.7%		37.4%	38.6%	17.3%
			Maximum:	26.4%	22.7%	41.6%	12.2%	15.5%		43.5%	41.6%	21.1%
			Weighted average:	20.4%	22.0%	39.3%	11.5%	6.9%		42.3%	39.3%	18.4%

The buys, holds and sells summary categories' averages during the economic contraction and negative sentiment periods further only differed by 0.19 per cent, 0.23 per cent and -0.43 per cent respectively, indicating a very similar recommendation pattern among analysts for all categories during negative cycles. Conversely, the summary categories' averages during the economic expansion and positive sentiment periods differed by -4.14 per cent, 3.57 per cent and 0.58 per cent respectively, indicating a very similar recommendation pattern only for the sells category. Figure 3.2 offers a visual depiction of the aforementioned relationship.

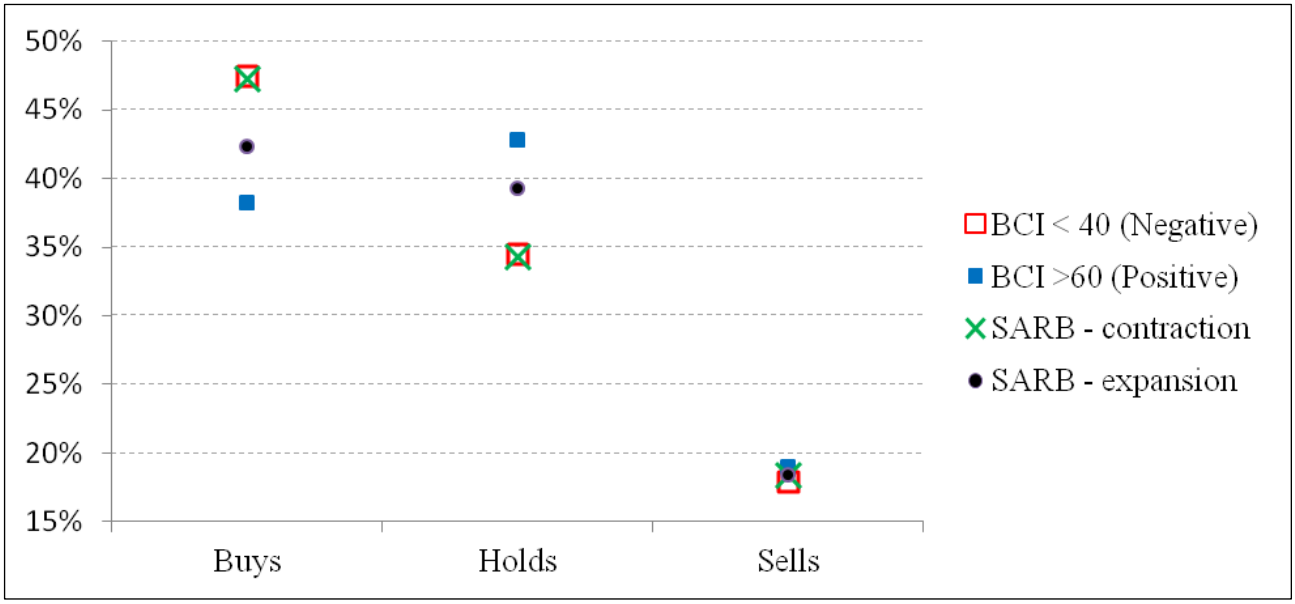

Figure 3.2: Average buys, holds and sells across sentiment – and economic growth cycles

The number of sells issued by analysts during negative periods overlaps for all four data points in Figure 3.2, while the expectation would have been that percentage sells during 'BCI < 40' and 'SARB - contraction' would be higher than during 'BCI > 60' and 'SARB - expansion' respectively. The analysts therefore did not issue more negative recommendations during negative cycles. Another unexpected visual result is that the percentage buys was less than the percentage holds during positive cycles. One possible explanation could be that the analysts started issuing positive (negative) recommendations before the end of the negative cycles (positive cycles) in anticipation of what was to come; while another reason could have been that the measurement of the cycles by the SARB and the BER respectively lagged the actual cycles experienced by the listed shares that received recommendations. The results of the statistical significance tests of the differences between the negative and positive cycles are displayed in Table 3.5.

Table 3.5: Change in category incidence: negative cycles to positive cycles

	Buys	Holds	Sells
Positive sentiment % minus negative sentiment %	-9.25%*** (-13.08)	8.26%*** (12.03)	0.99%* (1.8)
Contraction % minus expansion %	-4.91%*** (-8.56)	4.92%*** (8.36)	-0.02% (-0.03)

The test-statistic value for the z-test for proportions is indicated in brackets. Differences marked with asterisks are statistically significant in a two-tailed test of whether the proportions differed significantly among the various periods ($P_1 \neq P_2$).

The analysts' recommendation issuance patterns for buys and holds changed significantly over both sentiment and economic cycle tests. The unexpected 0.99 per cent higher incidence of sell recommendations during positive sentiment periods than during negative periods was only weakly significant, while the incidence of sells during both economic contraction and expansion periods were not statistically significantly different from each other. Analysts are therefore judged to have been overly positive during periods of low business confidence and economic contractions, and exhibited a positive bias. This result leads to the conclusion that the null hypothesis of Hypothesis 3.2 cannot be rejected, and that analysts did not issue more strong sell- and sell recommendations during times of negative sentiment and economic contraction than during times of positive sentiment and economic expansion. This finding supports the notion of a positive bias among analysts.

The preferred recommendation categories and pattern distribution of analysts are indicated in Table 3.6.

The two most common recommendation patterns are ranked first and sixth (13.5 per cent and 15.5 per cent respectively), indicating that almost a third of analysts either issued recommendations throughout the five-point scale or chose to only issue buy-, hold- and sell recommendations. Although analysts only issuing buy-, hold- and sell recommendations are the most prevalent, analysts issuing recommendations from strong buy through to strong sell were the most active over the sample period.

Signs of a positive bias are evident throughout Table 3.6. Analysts who never issued buy- and strong buy recommendations comprised 13.2 per cent of the sample, while 38.6 per cent never issued a sell- and strong sell recommendation. The second most active group of analysts only issued strong buy- to sell recommendations, choosing to not issue strong sell recommendations at all and only issue negative sell recommendations 11.9 per cent of the time.

Table 3.6: Top-15 recommendation pattern activity distributions (1993-2011)

	Strong buy	Buy	Hold	Sell	Strong sell	Average of analysts' total activity	Proportion of analysts using pattern
Recommendation patterns	4 835 (28.2%)	2 965 (17.3%)	5 955 (34.7%)	1 853 (10.8%)	1 557 (9.1%)	133	13.5%
	384 (18.2%)	673 (31.9%)	800 (38%)	251 (11.9%)		47	4.7%
		125 (31.8%)	179 (45.5%)	71 (18.1%)	18 (4.6%)	44	0.9%
	671 (34.3%)	292 (14.9%)	763 (39%)		228 (11.7%)	41	5.0%
	827 (38.4%)		917 (42.6%)		407 (18.9%)	28	8.1%
		1 397 (35.6%)	1707 (43.5%)	817 (20.8%)		27	15.5%
	128 (37.4%)		159 (46.5%)	55 (16.1%)		19	1.9%
		67 (48.2%)	44 (31.7%)		28 (20.1%)	12	1.3%
	73 (30.9%)	75 (31.8%)	88 (37.3%)			11	2.3%
	50 (64.9%)				27 (35.1%)	9	0.9%
	9 (69.2%)			4 (30.8%)		7	0.2%
		244 (50.1%)	243 (49.9%)			6	8.4%
	143 (50.5%)		140 (49.5%)			5	5.8%
			9 (36%)	10 (40%)	6 (24%)	5	0.5%
			57 (53.3%)	50 (46.7%)		5	2.3%

The number of instances per recommendation category is presented; and the percentage occurrence within the pattern displayed in brackets. The list is sorted according to the 'average analyst activity' among individual analysts who issued recommendations according to the pattern. 'Average analyst activity' is the mean amount of recommendations per analyst per recommendation pattern. The percentage of analysts who only issued recommendations under a certain pattern is indicated under "Proportion of analysts using pattern".

The third most active analyst group only issued buy- through to strong sell recommendations. Although this group contains two negative recommendation categories and only one positive recommendation category, only 22.7 per cent of this recommendation pattern was negative recommendations, again supporting the notion of negative-recommendation aversion among the analysts. All the aforementioned results support the notion in Proposition 3.3 that analysts did not issue recommendations according to uniform patterns.

Analysts who are positively biased would therefore be expected to rather issue a hold recommendation than a negative recommendation. The abnormal return for hold recommendations should therefore be expected to be slightly negative if the group contains both true hold recommendations and concealed negative opinions.

The abnormal returns on the day of and the day after the recommendations for the 1993 tot 2011 period are indicated in Table 3.7.

Share prices reacted positively to strong buys on the day of and the day after the recommendation was issued, while strong sells triggered immediate reaction only on the day of the recommendation publication. Whereas strong buy recommendations produced a significant impact on day t and day t+1, strong sell recommendations only had a larger immediate negative abnormal return impact on day t. The addition of the November 1993 to December 1994 period to Chapter 2's sample period therefore did not change the results or the conclusions drawn from it.

Hold recommendations produced a weak negative impact on both the day of and the day after the recommendation, supporting the theory of analysts rather issuing a hold recommendation than a negative recommendation. Market participants interpreted the hold recommendations as negative, albeit not as negative as the sell- and strong sell recommendations.

Although Hypothesis 2.1's notion that abnormal return impact of analyst recommendations has again been demonstrated to be related to the level of the recommendation (tested over a different period in this chapter), the proportion of analyst recommendations causing an advised impact relative to the total activity of each analyst has never been investigated for JSE-listed shares. Figure 3.3 contains the analysts' average frequency of issuing recommendations that resulted in an advised directional MAR or RAR versus the total amount of recommendations issued by each individual analyst.

Table 3.7: Abnormal return impact of recommendations (1993-2011)

		Recommendation				
Abnormal return:		**Strong buy**	**Buy**	**Hold**	**Sell**	**Strong sell**
Market-adjusted	**Day t**	0.18%*** (4.35)	0.13%*** (3.36)	-0.02% (-0.65)	-0.08% (-1.42)	-0.23%*** (-3.44)
	Day t+1	0.14%*** (3.39)	0.08**% (2.21)	-0.01% (-0.46)	-0.05% (-0.54)	-0.04% (-0.62)
	Count	7 506	5 954	11 417	3 217	2 392
Risk-adjusted	**Day t**	0.16%*** (3.8)	0.12%*** (3.37)	-0.04% (-1.41)	-0.09% (-1.57)	-0.23%**** (-3.5)
	Day t+1	0.11%*** (2.95)	0.09%** (2.48)	-0.04% (-1.34)	-0.16%*** (-2.79)	-0.04% (-0.61)
	Count	5 233	5 123	10 078	2 851	2 196

Abnormal returns marked with asterisks are significant in a two-tailed test of whether the mean abnormal return is significantly different from zero.

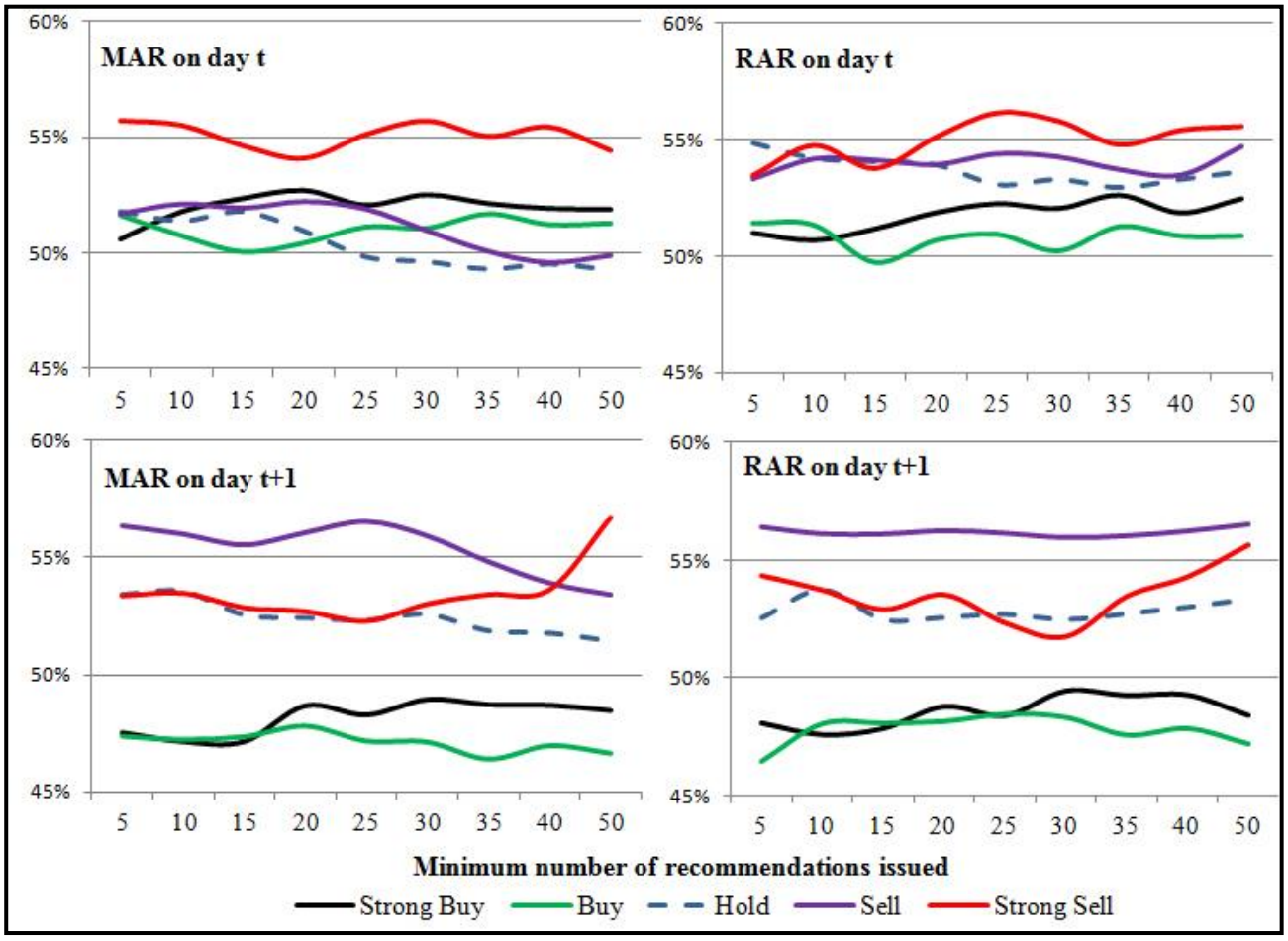

Figure 3.3: Analysts' average incidence of advised AR impact vs. minimum analyst activity

The four graphs in Figure 3.3 reveal that the advised impact frequency (AIF) of analyst recommendations across the board of recommendation categories remained more or less constant through the various minimum activity levels, with no strong visible linear increases or decreases. While Figure 3.3 does not incorporate the magnitude of the abnormal impact, it does visually advocate that analysts who issued more recommendations over time did not generally have a higher AIF than less active analysts for all recommendation categories. Only strong sell recommendations' impact for both MAR and RAR on day t+1 increased markedly when the analysts' total activity was above 40 recommendations in total.

When considering the individual recommendation categories, the MAR AIF and RAR AIF on day t for buys and strong buys increased steadily as the analysts' overall activity increased, while their AIF on day t for buys and strong buys was about five per cent more than on day t+1 for both MAR and RAR. Buy recommendations therefore appear to have had a slightly higher likelihood of an immediate expected impact on day t than on the day after the recommendation was issued, and a slightly greater incidence of negative abnormal returns on day t+1 than positive abnormal returns. The buy categories' positive average daily abnormal ARs on day t+1 in Table 3.7 therefore implies that the positive ARs outweighed the negative ARs although the positive ARs occurred less often.

Strong sell recommendations had the highest AIF on day t for both RAR and MAR, but had a similar AIF to hold recommendations on day t+1 where sell recommendations seemed the most likely to cause an expected impact. Both sell categories therefore appear to have triggered negative AR more frequently among investors than buy- and strong buy recommendations could cause a positive AR. In other words – investors reacted to bad news from analysts more frequently than to good news.

An important consideration when judging the MAR versus RAR results is that the RARs were all calculated with a one-year history. Recommendations issued within the first year of a share's listing therefore cannot have an associated RAR. The similarity of the patterns visible in the MAR and RAR graphs for both day t and day t+1 might therefore imply that a recommendation issued within the first year of a share's listing had more or less the same likelihood of generating an advised directional impact as recommendations after the one-year listing period.

Analysts generally did not seem to be able to issue influential recommendations with an advised impact whenever they wanted to, in line with patterns suggested by Loh and Stulz (2011). The AIF of the 135 analysts who issued more than or equal to 50 revisions in total (A>50) was compared to the AIF of the 766 analysts who issued less than 50 revisions in total (A<50) to see if the more active group had a greater tendency to produce an advised abnormal return. The difference in MAR AIF and RAR AIF between the two groups of analysts is displayed in Table 3.8.

Table 3.8: Difference of analysts with more recommendations vs. fewer recommendations

	AIF difference (P_1-$P_{2)}$				
	Strong buy	**Buy**	**Hold**	**Sell**	**Strong sell**
MAR_t	5.11% (1.18)	-2.55% (-0.59)	2.67% (0.62)	2.83% (0.65)	3.38% (0.79)
MAR_{t+1}	0.13% (0.03)	-1.77% (-0.41)	3.19% (0.74)	8.32%** (1.92)	7.9%** (1.82)
RAR_t	6.03%* (1.29)	-2.08% (-0.45)	0.36% (0.08)	-3.52% (-0.75)	-2.11% (-0.45)
RAR_{t+1}	0.14% (0.03)	1.3% (0.28)	5.86% (1.26)	11.25%*** (2.42)	9.09%** (1.95)

The test-statistic value for the z-test for proportions is indicated in brackets. Differences marked with asterisks are statistically significant in a one-tailed test of whether the proportions differed significantly, with the more active analysts as P_1 and the less active analysts as P_2 (P_1>P_2).

The A>50 group generally had a higher AR AIF than the A<50 group, although most of the AR AIFs for the various recommendation categories were not significantly different from each other. The A>50 group's AIF of strong sell- and sell recommendations on day t+1 was significantly higher on than the AIF of the A<50 group, while the RAR AIF of strong buys on day t had a weakly significant higher incidence than that of the less active group. Overall, Hypothesis 3.4's null hypothesis of no difference between the A>50 and the A<50 groups' AIFs cannot be rejected, except for strong sell- and sell recommendations on day t+1. Analysts who issued more recommendations therefore did not have a greater frequency of issuing recommendations with an advised abnormal reaction in prices. Loh and Stulz (2011) did suggest that some analysts have a greater chance of creating an advised directional AR than other analysts, and that their affiliation to specific brokerages can influence their ability to impact share prices. The difference between the impact of analysts employed by brokerage houses who issued many recommendations and the overall average is displayed in Table 3.9.

The MAR abnormal impact differential in Table 3.9 does not indicate any discernible pattern of superior price impact by active brokerage houses' recommendation over and above those of the average individual analyst's recommendation impact. None of the test statistics indicate a significant difference between the averages of the samples, and Hypothesis 3.5's null hypothesis notion that brokerages that issued many recommendations through their analysts had an above-average abnormal impact on prices cannot be rejected. The result is unexpected seeing that Barber *et al.* (2000) argued that the size of the brokerage house employing analysts was aligned to the AR

impact of recommendations, and large brokerages should be expected to issue more recommendations than smaller brokerages.

Table 3.9: Differential impact between analysts employed by active brokerage houses and the full sample

		Recommendation				
Abnormal returns		**Strong buy**	**Buy**	**Hold**	**Sell**	**Strong sell**
Market-adjusted	**Day t**	0% (0.01)	0.02% (0.19)	0.01% (0.05)	-0.03% (-0.27)	0.01% (0.1)
	Day t+1	0% (0.02)	0.02% (0.32)	0% (-0.09)	-0.13% (-1.14)	-0.03% (-0.16)
Risk-adjusted	**Day t**	0.03% (0.29)	0% (-0.12)	0% (0.02)	-0.01% (-0.11)	0.04% (0.22)
	Day t+1	0.06% (0.74)	0.01% (0.14)	-0.01% (-0.43)	-0.07% (-0.74)	0% (0.01)
Brokerages:		14	14	17	11	10

An active brokerage house's analysts issued more than 250 recommendations in total. Only recommendation categories with more than 50 recommendations per brokerage were considered. Welch's t-test values for unequal samples with unequal variances are indicated in brackets. Values marked with asterisks are significant in a two-tailed test of whether the average abnormal return differentials are significantly different from zero.

3.5 CONCLUSION

This chapter argued that many of the analysts issuing recommendations on JSE-listed shares from 1993 to 2011 may have been overly positive when issuing recommendations. The result that supports this notion the strongest is where analysts on average did not change the proportion of negative recommendations during periods of market contraction or low business confidence when compared to periods where analysts were expected to be bullish. The decrease in hold recommendations was also positively correlated to the decrease in sell recommendations during periods where sells decreased; indicative of analysts assigning a similar sentiment to holds than to sells.

Hold recommendations were also associated with a small negative abnormal impact, and was therefore probably treated by investors as portraying a slightly negative sentiment, albeit not directly communicated. Only 13.5 per cent of analysts issued recommendations through all categories from strong buy through to strong sell, while the other analysts opted for differing recommendation patterns. The analysts therefore did not react uniformly, and exhibited

dissimilarities in their behaviour. Individual investors who intend on following an analyst or analysts should therefore be aware that analysts might react differently from each other to the same information, in line with the 'differences of opinion' theory (Harris and Raviv, 1993).

The analysis of the overall impact of recommendations indicates that analysts did indeed have a short-term abnormal impact on the market, with positive abnormal returns on both the day of and the day after strong buy recommendations were issued. Strong sells had an immediate negative abnormal impact on prices, indicating an immediate negative reaction from market participants.

The AIF-analysis further revealed that extremely influential recommendations did not occur 'at will' (in line with Loh and Stulz, 2011), and that the analysts who issued more recommendations did not necessarily have a higher success rate in issuing influential recommendations. That said, strong sells and sells had a greater frequency of an advised directional impact than buys and strong buys. Strong buys and buys further had a lower chance of an advised abnormal impact on day t+1 than on day t, for all activity levels of analysts. In conjunction with the positive bias, market participants might perceive the strong sell and sell's information as more reliable because it is issued less often than buys. This trend might offer opportunities to investors who specialise in shorting shares associated with negative news.

The abnormal price impact of active brokerage houses did not differ significantly from the overall average recommendation impact. Investors are therefore cautioned to not necessarily expect that a recommendation will be influential because of the brokerage associated with it. The natural skill of the analyst, the public's perception of the analyst and superior access to information may be factors separating the analysts from each other, and not necessarily the brokerage employing the analyst.

The research questions covered in Chapter 3 are updated in Figure 3.4, and the abbreviated research questions of the next chapter presented in the bottom column (to be read from right to left). Now that a possible positive bias among analysts, how analysts structured their individual recommendations across the various recommendation categories, and how the number of recommendations issued per analyst or brokerage influenced the impact of their recommendations have been investigated, further tests regarding how often analysts were successful in causing a significant AR-impact and how they may have influenced each other's activity are presented in Chapter 4.

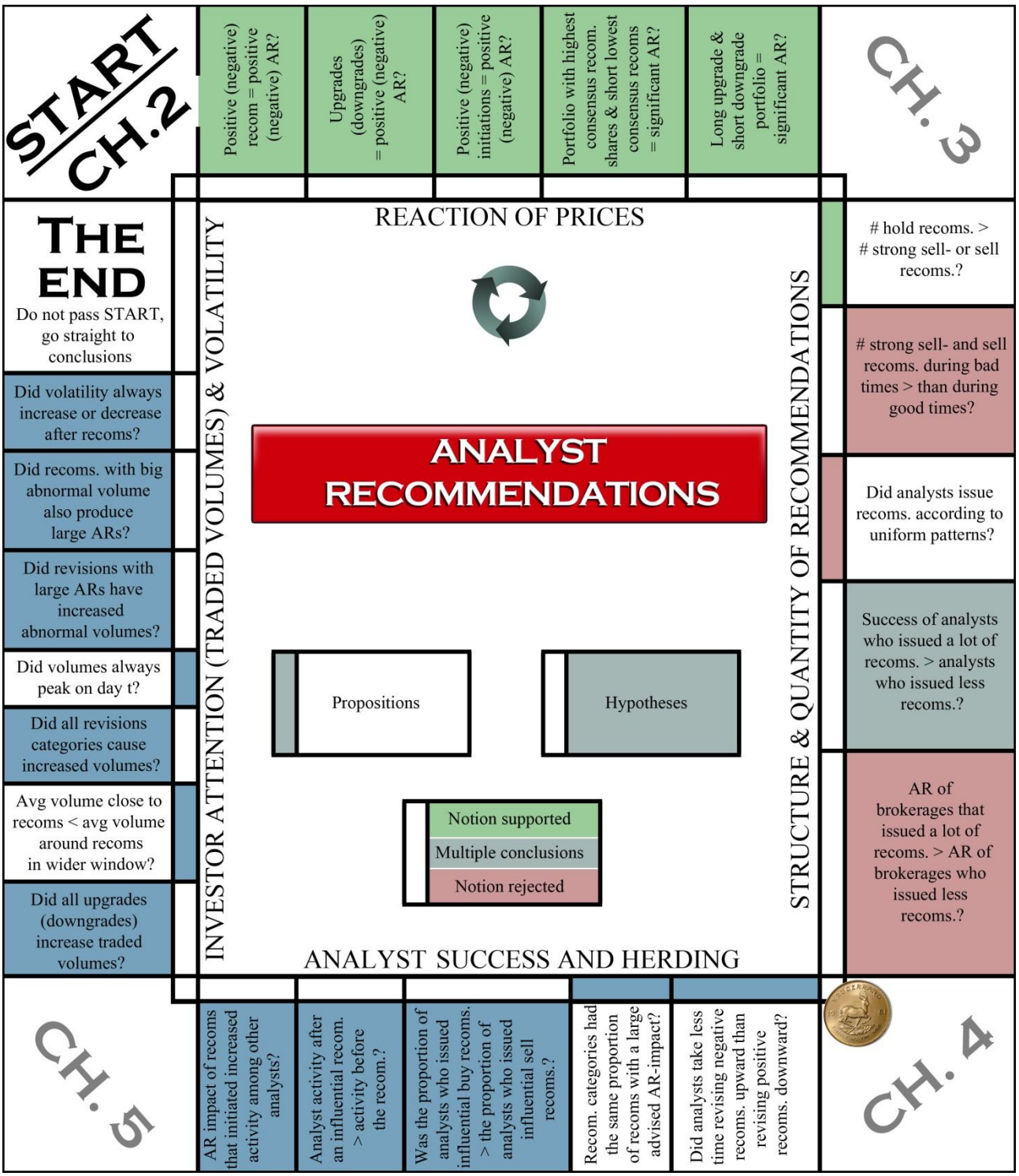

Figure 3.4: Game-board map of the study: Chapter 3

CHAPTER 4:
INFLUENTIAL ANALYST RECOMMENDATIONS AND SUBSEQUENT ANALYST ACTIVITY

4.1 INTRODUCTION

Analysts who issue recommendations compete with other analysts concerning their individual opinions of future share prices and the timing of the release of recommendations. Any group of analysts covering specific shares or sectors will inevitably have much of the same information, and an analyst's skill in issuing credible reports regularly will be measured against the rest of the analysts. Analysts who have the most skill in gathering, interpreting and producing information over time may become leader-analysts, even causing other analysts to issue recommendations as a response (Loh and Stulz, 2011).

The price effect of recommendations by analysts who are trusted by market participants may also be greater than those of other analysts (Stickel, 1995). Star analysts who have received various accolades may also prove to have a greater active audience than other analysts, even outperforming non-star analysts (Fang and Yasuda, 2014). The aforementioned evidence by Stickel (1995) and Fang and Yasuda (2014) indicates that analysts had varying levels of skill and impact, and that analysts should not be expected to be homogenous in their skill or market presence (Xu, Chan, Jiang and Yi, 2013).

The new information, in the form of recommendations issued by analysts, may impact other variables than only share prices over time – the analysts' reputation, their relationships with company insiders and even their career paths can be affected by their reports. Analysts who issue recommendations that are not in line with positions held by the management company employing the analysts, have even been reported to fall out of favour with their employers (Hong and Kubik, 2003). Analysts may therefore be influenced to issue recommendations at levels and at times when they would not normally have done so.

This chapter investigates the activity levels of analysts and the occurrence of recommendations associated with a large abnormal impact. Analysts' activity per individual share and per analyst portfolio was analysed, and the ability of analysts to issue recommendations that produced heightened analyst activity among other analysts was measured. The average abnormal price impact of the recommendations that caused a significant increase in activity among other analysts was also measured. The results and discussion follow the literature review and methodology.

4.2 LITERATURE REVIEW

The recommendations and reports issued by analysts should be viewed as new information flows or information signals (Hanousek and Kopřiva, 2013). New information may change the opinions of market participants and other analysts if the information is deemed noteworthy. Influential recommendations that change the market's opinion about the pricing of a security are deemed to bring forth a "paradigm shift" (Loh and Stulz, 2011:3) and are normally associated with significant abnormal returns.

4.2.1 The case for analyst recommendations

Although the strong form of the efficient market hypothesis (Fama, 1970) stated that the 'paradigm shift' should be reflected in prices immediately, Grossman and Stiglitz (1980) suggested that an instantaneous and perfect price adjustment would leave no opportunity for information gatherers and interpreters, like analysts, to deliver a service and profit from their expertise. The ability of analysts to predict and sometimes cause abnormal price movements is therefore important to investors and brokerages, as they would only listen to an analyst's opinion if the potential gains outweigh the cost of employing analysts for their expertise (Womack, 1996). The attention and remuneration that analysts have received over the years indicate that investors believed in both the analysts' superior interpretative ability and the investors' own partial inability to acquire and interpret all information immediately and correctly.

Analysts issue and revise their opinions once new information concerning companies, sectors and markets are obtained and interpreted. Previts *et al*. (1994) identified that industry- and business related news, contextualised by the relative size and product offering of the other companies competing for the same area of business, strongly affected analysts' opinions. Although the release of annual financial data and upcoming mergers were identified as some of the financial trigger-events leading to recommendation revisions, non-financial information was suggested to be of greater value to sell-side analysts (Kerl *et al*., 2012). Statements made by management, adjustments in strategic positioning of companies and news affecting a company's operating environment were also recognised by Kerl *et al.* (2012) as the foremost factors causing recommendation revisions.

4.2.2 The market's reaction to analyst activity and herding among analysts

Analysts who revised their recommendation more frequently than others were proven to have a greater impact on shares than analysts who did not (Hobbs *et al*., 2012), while recommendation revisions in general were demonstrated to have a greater abnormal price impact than recommendation initiations (Boni and Womack, 2006; Jegadeesh and Kim, 2010). Market participants therefore paid more attention to analysts who were perceived to have greater levels of

activity and who frequently guided and updated investors as share prices adjusted. The analysts themselves should be aware of the reliance of investors on their recommendations.

Analysts have historically been prone to behavioural errors and a strong positive bias (Diefenbach, 1972; Stickel, 1995; Barber *et al*., 2001), sometimes rather stopping their coverage and recommendations than publishing negative news. Prayag and Van Rensburg (2006:7) suggested that the sell recommendations were such a small percentage of their sample because analysts wanted to "stimulate share trades and cultivate relations with management", while Hanousek and Kopřiva (2013) stated that analysts may publish many positive recommendations to generate trading commissions.

Recommendation initiations can normally be expected to be a strong buy- or buy-, less frequently a hold-, and rarely a sell- or strong sell recommendation (McNichols and O'Brien, 1997). Concerning negative news, Barber *et al.* (2000) suggested that larger brokerage companies might delay the issuance of a sell recommendation to avoid damaging potential or existing relationships. Affiliated analysts were further found to be more reluctant to issue negative opinions when compared to non-affiliated analysts (Kadan *et al*., 2009). A clear difference in activity and the type of recommendation might therefore be visible when comparing affiliated analysts to non-affiliated analysts.

The tendency among a group of analysts to act in a similar fashion during a certain period is called herding (Jegadeesh and Kim, 2010). Trueman (1994) suggested that herding may occur because of incentivisation schemes that encourage a comparable or similar reaction, and found that some herding analysts' coinciding reactions were not even justified by the information in their possession. While the herding behaviour has been identified among certain groups of analysts, an 'anti-herding' tendency among other analysts has also been confirmed (Chen and Jiang, 2006). 'Anti-herding' is where analysts issue recommendations away from the consensus opinion, taking a contrarian view when interpreting the information available to the analyst.

4.2.3 The chance of issuing an influential recommendation

The timing of a recommendation, how it compares to the consensus opinion and the prior success of analysts should be investigated by market participants when considering whether the recommendation is insignificant or influential. Influential recommendations are expected to stimulate activity by other analysts in the form of revisions or initiations, as well as trading activity by market participants (Loh and Stulz, 2011). Loh and Stulz (2011) found that 56 per cent of analysts never issue an influential recommendation revision when measuring cumulative abnormal returns, while only one in ten recommendations that did not coincide with an earnings announcement generated or coincided with an influential return. Analysts who issued influential

recommendations were also found to issue an influential recommendation only once out of every five recommendations on average.

As not all recommendations are influential, investors would want to pay specific attention to recommendations with a high probability of creating an abnormal return. Balashov (2013) reported that 'first-movers' are more likely to have an impact on share prices, and that recommendations coinciding with company earnings announcements have a higher probability of an abnormal price impact than recommendations not associated with an expected flow of information. Influential buy- and sell recommendations have also been observed to have a direct positive influence on the two recommendations following the influential recommendation (Welch, 2000), while recommendations without at least one coinciding analyst report or without consensus agreement by other analysts concerning the direction of the price change should not be expected to have a sustained abnormal impact on prices (Savor, 2012).

Although the timing of a recommendation relative to other recommendations may have an influence on the market's reaction, the underlying company and the broker employing the analyst may also influence the magnitude of the impact of recommendations. According to Loh and Stulz (2011), the bigger the company size and the depth of analyst coverage, the more difficult it also is for an analyst to make an influential recommendation because of the amount of scrutiny received by the specific company. Bradley, Clarke and Cooney (2012:2191) found that unaffiliated analysts from "high reputation" banks had a higher success rate than unaffiliated analysts employed by other banks when issuing influential recommendations during periods of initial public offering under-pricing.

The investors buying and selling the shares are ultimately the ones who collectively determine price levels according to their reaction to new information. Savor (2012:635) investigated the behaviour of investors relative to the types of information they were presented with. Savor concluded that "investors under-react to news about fundamentals and over-react to other shocks that move stock prices."

The exploratory research questions and the research questions that were formulated from the literature are listed below. Research questions (i) to (iii) are exploratory questions that have not been specifically addressed in prior research. Research questions (iv) and (v) flow from the prior research by Loh and Stulz (2011) and their calculations follow a similar methodological approach as implemented by Loh and Stulz (2011).

(i) Did analysts take less time to revise negative recommendations upward than revising positive recommendations downward?

(ii) Did an equal proportion of analysts issue influential recommendations across all five recommendation categories?

(iii) Was the proportion of analysts who issued influential strong buy (buy) recommendations greater than the proportion of analysts who issued influential strong sell (sell) recommendations?

(iv) Did activity among analysts increase after an influential recommendation was issued?

(v) Did recommendations that caused increased activity among other analysts have a significant abnormal price impact?

4.3 DATA AND METHODOLOGY

The five-point recommendation scale from strong buy (1) to strong sell (5) was again used in this chapter; and buys and strong buys (sells and strong sells) collectively referred to as positive (negative) recommendations. Hypotheses and propositions were identified from the research questions that were identified from the existing body of knowledge. The hypotheses and propositions are listed below, followed by a brief description of the test(s) related to the specific hypothesis.

Hobbs *et al.* (2012) found that analysts who revised both their positive and negative recommendation more frequently than others were proven to have a greater investment value for investors. Proposition 4.1 stems from their finding, and compares the frequency of analysts' revisions of positive and negative revision categories without accounting for the impact of the recommendations.

Proposition 4.1: Analysts take less time to revise negative recommendations upward than to revise positive recommendations downward.

The days between all of the analysts' individual activity (i) on a specific share, and (ii) on all of the shares covered by them individually were measured. In other words, the days between the recommendations of analyst i only for share j represented measurement (i), and the days between the recommendations of analyst i for any of the n shares within his or her coverage (share 1..n) represented measurement (ii). The results were then grouped into weeks and displayed in a graph.

Proposition 4.2: Equal proportions of analysts issue recommendations that have an advised directional AR-impact of five per cent or greater across all recommendation categories.

Because the dataset also contains recommendations from international analysts, the short-term abnormal total return price impact was measured on the day of the recommendation's publication in the database as well as the day after the publication to account for recommendations issued after the close of trade in South Africa by either international or local analysts. The aforementioned trade

days are denoted as day t and day t+1 respectively. The abnormal return (AR) indicators used were market-adjusted return (MAR) and risk-adjusted return (RAR). Cumulative market-adjusted returns (CMAR) and cumulative risk-adjusted returns (CRAR) were calculated as the sum of the corresponding MAR and RAR for day t and day t+1 respectively.

The number of influential analysts and how often analysts issued influential recommendations were measured. Stoppage of coverage was also included in the negative category with sell and strong sell as it has been proven to be interpreted as a negative sign by market participants; and analysts' 'advised return' was defined as positive and negative ARs for positive and negative recommendation categories respectively. Similar to Loh and Stulz (2011), price-movement thresholds were introduced to determine if price movements after positive- and negative recommendations exceeded the threshold for recommendations. Loh and Stulz (2011:2) stated that a one per cent abnormal return over and above the expected return from a risk-adjusted model would be regarded as "noise" or normal by most market participants in the US. Thresholds were therefore set at one, three and five per cent abnormal return in this study to measure how often those levels were breached, and the recommendations that caused an advised directional AR greater than these levels were defined as 'influential'. For example: If the threshold was five per cent, the number of analysts with buys and strong buys with an impact of five per cent or more was measured, while sell, strong sells and stops would only be counted if the subsequent abnormal impact reaction was minus five per cent or less. The number of analysts was then divided by the total sample size as well as the active analysts per recommendation category as indications of (i) overall incidence and (ii) incidence among analysts issuing recommendations within the specific recommendation category.

Hypothesis 4.3: The proportion (P1) of analysts who issue influential strong buy (buy) recommendations is greater than the proportion (P2) of analysts who issue influential strong sell (sell) recommendations (P1>P2).

A control group was defined to isolate active analysts who issued many recommendations over time. The control group excludes all initiations and stoppages, all stale recommendations, and all analysts who issued less than ten recommendations. 'Stale' recommendations were defined by Loh and Stulz (2011) as recommendations that have not changed during the preceding year, and similarly a recommendation was defined as 'stale' in this study if it had not been revised during the preceding 365 calendar days. The incidence of analysts issuing influential 'advised return' recommendations with a threshold of five per cent was determined for the control group, and indicated as a percentage of control group analysts. Analysts who issued influential recommendations more than 25 per cent of the time were defined as 'successful' analysts.

Hypothesis 4.4: Activity among analysts increases after an influential recommendation is issued (LFR > 1).

Analyst activity was measured according to the Cooper, Day and Lewis (2001) leader-follower ratio (LFR). An analyst recommendation's LFR is a ratio of activity of other analysts before the recommendations versus activity after the recommendation. The number of days from the current recommendation (on day t) to any two recommendations (that were issued by two different analysts) was measured for both the periods before and after the recommendation was issued. The LFR was then calculated by dividing the sum-total of the two preceding recommendations' days by the sum-total of the subsequent two recommendations' days. Figure 4.1 demonstrates other analysts' activity around recommendation *i* as inputs when calculating an LFR.

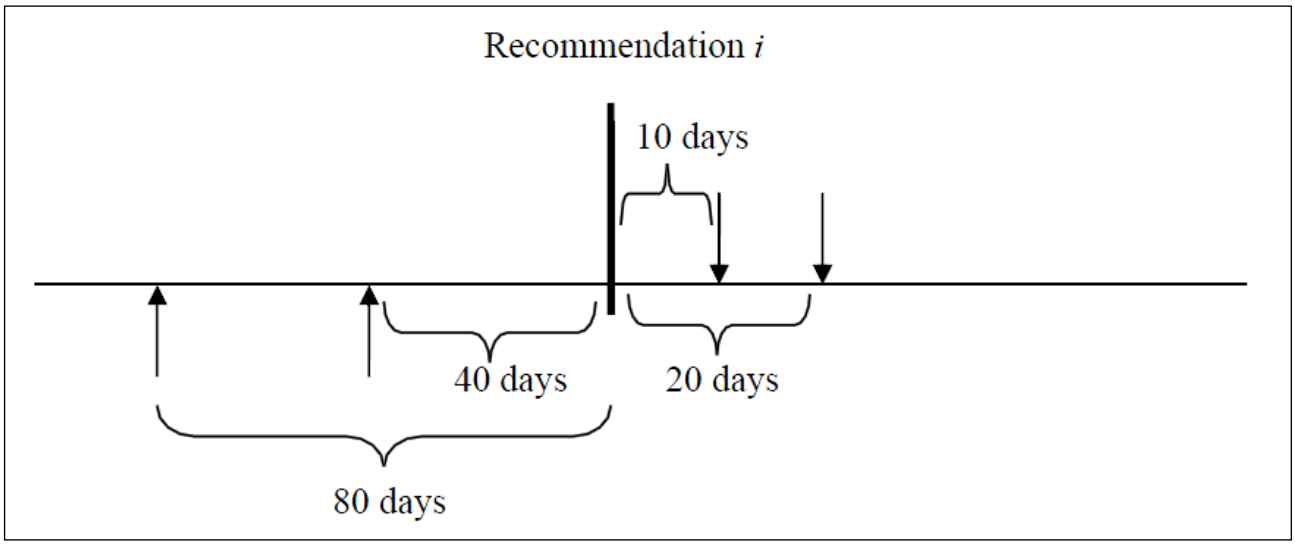

Figure 4.1: Recommendations used in the leader-follower ratio

Source: Loh and Stulz, 2011.

The LFR for recommendation *i* in Figure 4.1 would be (80 + 40) / (20 + 10), and equal to four. A LFR of one would imply that analyst activity did not speed up or slow down around a recommendation, while an LFR of less than one is indicative of a slowdown in other analysts' activity following a recommendation. The LFR of four therefore indicates increased activity among analysts after the recommendation.

The average LFR per recommendation category was calculated for recommendations that had an advised CMAR- and CRAR impact of more than three and five per cent respectively, and a test statistic calculated to determine if the average LFR is statistically significantly different from an LFR of one. If more than one analyst issued recommendations on the same day for the same share, the coinciding recommendations were excluded from the LFR calculation because the sequence of the recommendations could not be determined as an indication of a recommendation's influence.

Hypothesis 4.5: A recommendation that causes heightened activity among other analysts will have a significant abnormal price impact ($AR_{buys} > 0\%$; $AR_{sells} < 0\%$).

Lastly, the average CMAR and CRAR for recommendation revisions with an LFR of more than three was calculated to determine if recommendations that cause activity among analysts had a significant abnormal price impact. An LFR of three was chosen as the threshold after inspection of the data revealed an LFR of three to be the approximate start of the most influential quintile of recommendations.

4.4 RESULTS AND DISCUSSION

The incidence of influential analyst recommendations on JSE-listed shares and the subsequent reaction of analysts to these recommendations were investigated. The results of this research are presented and discussed in this section. The 901 analysts from 105 brokerages houses issued 37 433 initiations, revisions and stops over the 1993 to 2011 period. Strong buy-, buy-, hold-, sell- and strong sell recommendations represented 24.6 per cent, 19.5 per cent, 37.4 per cent, 10.6 per cent and 7.8 per cent of the sample respectively.

The incidence of positive recommendations was more than the incidence of negative recommendations for every calendar year, and hold recommendations were issued the most over the entire sample. The number of recommendations within the recommendation categories varied over time, with an inverse movement between buy- and strong buy recommendations.

Analyst activity and coverage increased significantly from 1995 onwards in the post-*apartheid* South Africa. An average of four analysts issued recommendations per company, and an average of 212 shares were covered each day during each calendar year, with a maximum of 25 analysts covering a single company during 2010. Analysts who stopped issuing recommendations for a specific share waited an average (median) of 567 days (288 days) before initiating coverage again. Figure 4.2 displays the weeks between analysts revising their recommendations for a specific share; in other words, the days between the recommendations of analyst i for share j only.

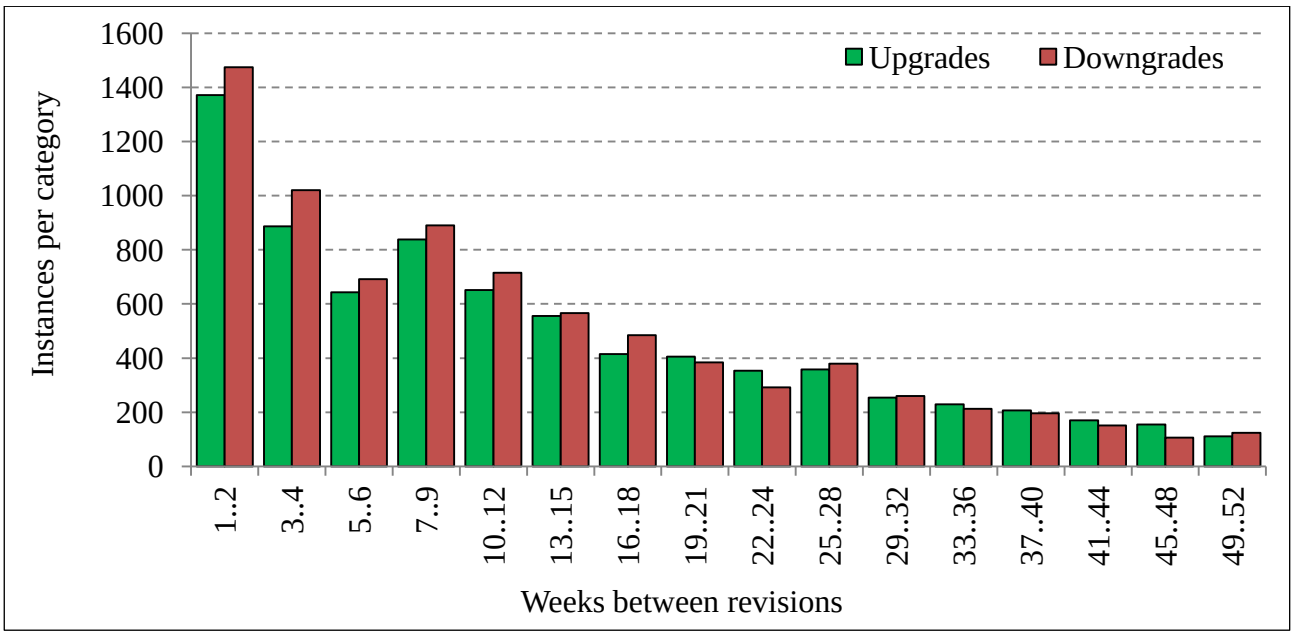

Figure 4.2: Weeks between individual analysts' revisions per single share

On average analysts were more prone to revise previous downgrade revisions than upgrades for revisions that occurred within 18 weeks. The tendency to leave positive recommendations in the form of upgrades for longer than downgrades probably stem from either the inherent positive bias thought to exist among analysts (Barber *et al.*, 2001; Stickel, 1995; Diefenbach, 1972). This result supports Proposition 4.1's notion that analysts will take less time to revise negative recommendations upward than the time they take to revise positive recommendations downward.

Although analysts revised their recommendations for a specific share after an average of 12.1 weeks, they revised their recommendations for a share within the first two weeks more often than in any other window period. Closer inspection revealed that these 'quick revisions' accounted for 18.7 per cent of the sample and predominantly fell into one category: the category was recommendations that toggled between hold and either strong buy, buy or sell; and these 'back-and-forth' recommendations accounted for 33.3 per cent, 14.2 per cent and 20.9 per cent of 'quick revisions' respectively.

These 'quick revisions' may have happened for a wide variety of reasons, among which that analysts changed their revisions back to hold after a certain price target was reached within the two-week period. Analysts who trade with algorithms or short-term momentum strategies will be more prone to revise in this manner than analysts who analyse companies according to a long-term valuation methodology. Figure 4.3 displays the weeks between individual analysts' revisions of their recommendations for any share under their coverage; in other words, the recommendations of Analyst i for any of the n shares within his or her coverage (share 1..n).

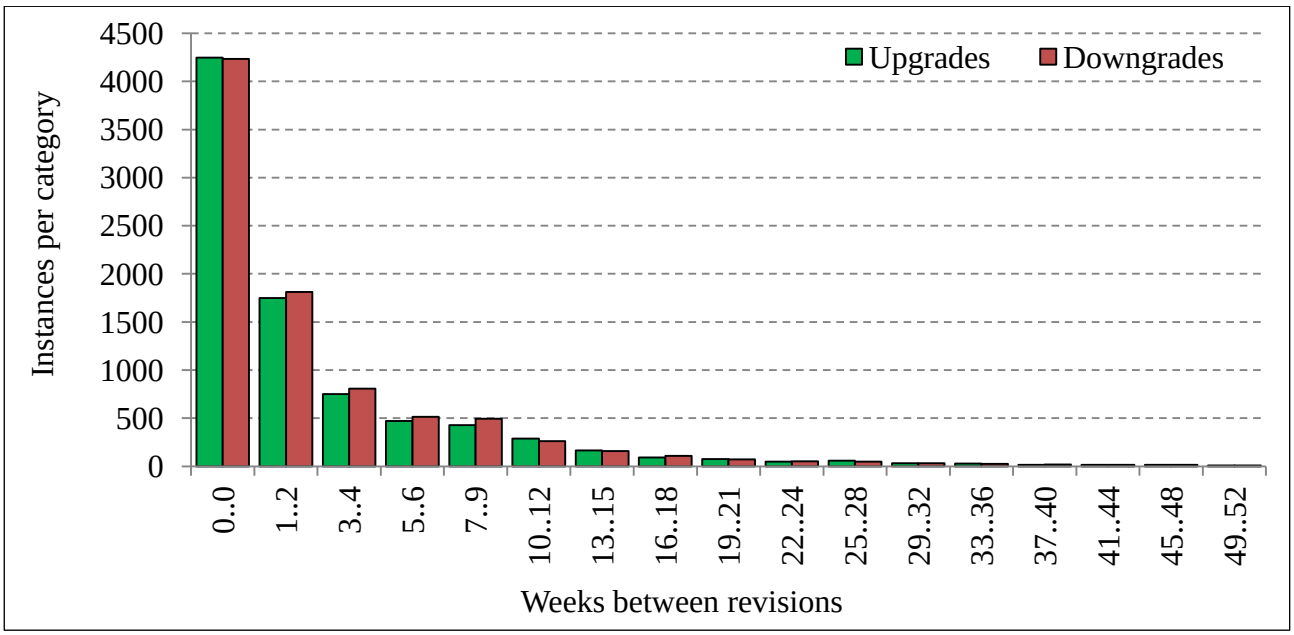

Figure 4.3: Weeks between individual analysts' revisions for any share

Figure 4.3 depicts that analysts often issued recommendations for many shares on the same day, possibly indicating that these analysts were covering similar companies or interpreted macro-economic events for all or some of the shares covered. The incidence of analysts reviewing their recommendations declined steadily per week over the one-year revision period.

The incidence of analysts issuing influential recommendations was investigated by measuring how many analysts issued recommendations that coincided with abnormal price reactions that broke through the various thresholds. The incidence of recommendations that had the advised positive or negative short-term impact is indicated in Table 4.1.

Table 4.1: Percentage of analysts issuing influential recommendations

Panel A: Market-adjusted abnormal returns on day t

MARs > threshold				**MARs < threshold**			
Threshold	**Strong buy**	**Buy**		**Threshold**	**Sell**	**Strong sell**	**Stop**
1%	35.1% (69.8%)	40.5% (66.5%)		-1%	27% (60.0%)	18.6% (54.7%)	49.2% (60.8%)
3%	21.6% (43%)	22.8% (37.3%)		-3%	13.8% (30.6%)	9.9% (29.0%)	24.6% (30.5%)
5%	12.9% (25.6%)	12% (19.7%)		-5%	6.5% (14.6%)	5.4% (16%)	10.7% (13.2%)

Panel B: Market-adjusted abnormal returns on day t+1

MARs > threshold			MARs < threshold			
Threshold	**Strong buy**	**Buy**	**Threshold**	**Sell**	**Strong sell**	**Stop**
1%	33.9% (67.3%)	38.5% (63.2%)	-1%	26.1% (58.0%)	20.1% (59.0%)	51.3% (63.4%)
3%	21.5% (42.8%)	21.5% (35.3%)	-3%	12.4% (27.7%)	11.7% (34.2%)	27% (33.3%)
5%	12.8% (25.4%)	11% (18.0%)	-5%	7.2% (16.0%)	6% (17.6%)	15.1% (18.7%)

Panel C: Risk-adjusted abnormal returns on day t

RARs > threshold			RARs < threshold			
Threshold	**Strong buy**	**Buy**	**Threshold**	**Sell**	**Strong sell**	**Stop**
1%	32.6% (64.9%)	38% (62.3%)	-1%	24.2% (53.8%)	18.2% (53.4%)	45.6% (56.4%)
3%	20.9% (41.5%)	20.8% (34.1%)	-3%	12.5% (27.9%)	9.3% (27.4%)	22.2% (27.4%)
5%	12.3% (24.5%)	10.5% (17.3%)	-5%	6.5% (14.6%)	4.7% (13.7%)	9.3% (11.5%)

Panel D: Risk-adjusted abnormal returns on day t+1

RARs > threshold			RARs < threshold			
Threshold	**Strong buy**	**Buy**	**Threshold**	**Sell**	**Strong sell**	**Stop**
1%	33.6% (66.9%)	35.1% (57.6%)	-1%	22.5% (50.1%)	19.1% (56%)	45.7% (56.5%)
3%	19.8% (39.3%)	19.9% (32.6%)	-3%	11.1% (24.7%)	10.4% (30.6%)	24.5% (30.3%)
5%	11.4% (22.7%)	9.9% (16.2%)	-5%	6.1% (13.6%)	5.3% (15.6%)	14.1% (17.4%)

The incidence is firstly indicated as a percentage of the total sample, and the incidence per category relative to the number of analysts who were active in that category is shown in brackets.

All four panels in Table 4.1 firstly reveal that less of the 901 analysts issued influential sell- or strong sell recommendations than positive recommendations. The high proportion of influential stops relative to negative recommendations for the full sample is a further sign that market participants might have interpreted a stop recommendation as an analyst choosing to rather not issue

a negative opinion. The high incidence of analysts issuing recommendations with an impact greater than one per cent abnormal return supports Loh and Stulz's (2011) finding that a one per cent abnormal return move is not necessarily an isolated or special occurrence.

Strong buy recommendations had the highest incidence of influential recommendations throughout when measuring the AR against the recommendation category's active analysts for both MAR and RAR. The proportion of analysts that issued strong buy recommendations that caused a five per cent advised AR threshold was greater than those of any other recommendation category, ranging from 5.3 per cent to 13 per cent more often. This result contradicts the notion put forward by Proposition 4.2 that an equal proportion of analysts will have issued recommendations that had an advised AR-impact of five per cent or greater across all recommendation categories.

Strong sell recommendations and stops had almost two per cent more influential recommendations on day t+1 than on day t, while positive recommendations had a higher occurrence of influential recommendations on day t than day t+1.

Another control group of analysts was defined to compare the impact of analysts who issued many recommendation revisions to that of less active analysts. The control group excludes all initiations and stops, all stale recommendations, and all analysts who issued less than ten recommendations. Investors who are guided by analysts' advice would want the analyst to have an active presence and a high incidence of influential recommendations revisions; which have been observed to be more influential than initiations or stops (Boni and Womack, 2006; Jegadeesh and Kim, 2006).

In the full sample of recommendations only 34 per cent (51 per cent) of analysts ever issued a recommendation or stop that had an advised impact of more than five (three) per cent abnormal MAR on day t or day t+1. Among the analysts in the control group, only 18 per cent (22 per cent) of analysts ever issued a recommendation or stop that had an advised impact of more than five (three) per cent abnormal MAR on day t or day t+1. A drop in the incidence of influential recommendations with an advised reaction occurred when comparing the control group to the full sample. This may have occurred because of a few different reasons. Some 'opportunistic' analysts may only have issued recommendations in the form of initiations when significant new information emerged (i.e. around earnings announcements that were lower or higher than expected), instead of keeping an active presence in the market and thereby having more opportunities to be wrong. When scrutinising the recommendations, these 'opportunistic' analysts can normally be identified by their above-average frequency of stop recommendations in-between their other recommendations. A second cause of the drop in incidence can be that the less active analysts "piggy-backed" on changes in the consensus opinion that was driven by other analysts, and superficially benefited from a subsequent delayed reaction by market participants (Balashov, 2013:1).

Table 4.2 contains the percentage of control group analysts who issued influential revisions more than 25 per cent of the time. A z-test for proportions was calculated to determine if the proportion of analysts issuing influential strong buys (buys) are significantly larger than the proportion of analysts issuing influential strong sells (sells).

Table 4.2: The incidence of influential recommendation revisions among active analysts

		Strong buy (1)	Buy (2)	Hold (3)	Sell (4)	Strong sell (5)	$P_1 - P_5$	$P_2 - P_4$
	Active participants (n)	453	549	745	405	307		
	Control group (n_c)	265	300	397	256	206		
MAR>5%	**Day t**	10.6%	5.3%	6.0%	5.1%	5.3%	5.3%** (2.07)	0.2% (0.10)
	Day t+1	11.3%	8.7%	5.8%	5.5%	8.3%	3.0% (1.08)	3.2% (1.32)
RAR>5%	**Day t**	10.2%	4.7%	5.3%	4.3%	4.9%	5.3%** (2.12)	0.4% (0.21)
	Day t+1	10.6%	6.7%	5.0%	3.9%	7.3%	3.3% (1.23)	2.8% (1.33)

The number of analysts from the population who were active within a recommendation category is indicated by n, and the number of control group analysts per recommendation category by n_c. The control group's incidence of analysts who had an advised influence of more than five per cent AR more than 25 per cent of the time was calculated as a percentage of n_c. The test-statistic value for the z-test for proportions is indicated in brackets. Percentage differences marked with asterisks are statistically significantly different for a one-tailed test of whether the proportions differed significantly, with the strong buy (buy) proportion as P_1 and strong sell (sell) proportion as P_5 ($P_1 > P_5$).

The control group analysts had more or less the same spread of activity among recommendation categories when compared to the total population's distribution. Influential buys and strong sells were almost identical in their prevalence of influential recommendations for 'successful' control group analysts and did not prove to be significantly different from each other (not indicated in Table 4.2). The incidence of influential buy recommendations was also not significantly different from that of sell recommendations, while the proportion of analysts who issued influential sell recommendations was the lowest out of all the categories.

The incidence of influential strong buys that had an impact on both day t and day t+1 appeared higher than any other category, indicating a stronger reaction by the market to the 'successful' analysts' strong buy recommendations. The proportion of influential strong buy recommendations

was only statistically significantly higher than influential strong sells on day t, and not on day t+1. The null hypothesis of Hypothesis 4.3 can therefore only be rejected for day t, indicating that a higher proportion of strong buys were influential than strong sells on day t. This reaction to positive recommendations might be because the market trusted the consensus opinion of many analysts more when they signalled buy opportunities compared to fewer analysts issuing warnings to sell specific shares.

The recommendation-issuance-reaction of other analysts to influential recommendations was measured by calculating the leader-follower ratio. The analyst activity after influential recommendations is displayed in Table 4.3.

Table 4.3: Analyst activity after influential recommendations

Panel A: Average LFR of CMARs breaking advised return thresholds

	Influential recommendation average LFR					
CMAR > threshold	**Strong buy**	**Buy**	**CMAR < threshold**	**Sell**	**Strong sell**	**Stop**
3%	2.37*** (9.77)	2.68*** (8.03)	-3%	2.61*** (3.90)	3.39*** (16.43)	2.25*** (9.61)
n	1225	904	**n**	478	330	990
5%	2.23*** (6.42)	2.89*** (5.78)	-5%	3.2*** (2.75)	4.6*** (14.61)	2.34*** (10.14)
n	651	426	**n**	233	153	407

Panel B: Average CRARs breaking advised return thresholds

	Influential recommendation average LFR					
CRAR > threshold	**Strong buy**	**Buy**	**CRAR < threshold**	**Sell**	**Strong sell**	**Stop**
3%	2.37*** (8.88)	2.66*** (7.56)	-3%	2.79*** (3.56)	3.47*** (13.84)	2.35*** (13.10)
n	896	785	**n**	397	276	740
5%	2.27*** (6.13)	2.87*** (5.70)	-5%	3.23*** (13.57)	4.66*** (12.92)	2.25*** (8.90)
n	469	348	**n**	184	135	347

The average LFR for recommendations with a return greater (lower) than the advised abnormal return threshold for positive (negative) recommendations is displayed, and the difference between the result and a LFR of one's test statistic is displayed in brackets. LFRs marked with asterisks are significantly greater (smaller) than a LFR of one for a one-tailed test.

Influential strong sell recommendations had the greatest effect on other market participants' issuance of recommendations, while influential strong buys and stops had the least effect on other analysts' activity. Except for strong buys, all of the recommendation categories caused an increase in activity when the threshold expanded from three per cent to five per cent. The LFRs of the influential recommendations were all highly significantly different from an LFR of one. This difference signifies a significant change in the occurrence of recommendations by other analysts after influential recommendations. The null hypothesis of Hypothesis 4.4, which implies that an influential recommendation's LFR will be equal to one, can therefore be rejected, implying that analysts likely initiated, revised or stopped their recommendations after an influential recommendation was issued.

The AR impact of recommendations with an LFR of three or more was calculated to measure if the increased analyst activity generally coincided with significant ARs. Of the total sample, only 5 090 recommendations produced an LFR of three or higher over the 35 recommendation revision categories in Table 4.4.

Table 4.4: AR impact of high LFR recommendations

Panel A: Cumulative average market-adjusted returns over day t and day t+1

CMAR > 3%		To recommendation:					
		Strong buy	**Buy**	**Hold**	**Sell**	**Strong sell**	**Stop**
From recommendation:	**Strong buy**		0.42% (1.04)	-0.01% (-0.03)	-0.4% (-0.38)	0.16% (0.19)	0% (0)
	Buy	0.36% (0.7)		-0.19% (-1.02)	-0.22% (-0.38)	-0.66% (-0.29)	0.02% (0.07)
	Hold	0.33%* (1.32)	0.7%*** (3.37)		-0.26% (-0.76)	-0.74%*** (-2.36)	0.13% (0.52)
	Sell	0.26% (0.13)	1.01%** (1.79)	0.16% (0.5)		-0.4% (-0.46)	0.23% (0.09)
	Strong sell	-0.47% (-0.57)	2.44%*** (3.03)	0.53%* (1.57)	0.31% (0.3)		-0.16% (-0.26)
	Initiation	0.01% (0.05)	-0.23% (-0.97)	-0.22%* (-1.31)	-0.52% (-1.23)	-0.39% (-1.01)	
	Stop	-0.46% (-0.79)	-0.01% (-0.02)	-0.13% (-0.38)	-1.00% (-0.72)	-0.65% (-0.69)	

Panel B: Cumulative average risk-adjusted returns over day t and day t+1

CRAR > 3%		To recommendation:					
		Strong buy	**Buy**	**Hold**	**Sell**	**Strong sell**	**Stop**
From recommendation:	**Strong buy**		0.3% (0.77)	-0.16% (-0.57)	0.03% (0.02)	0.09% (0.11)	-0.22% (-0.59)
	Buy	0.51% (1.06)		-0.26%* (-1.38)	0.12% (0.21)	-1.66% (-0.65)	-0.17% (-0.69)
	Hold	0.43%** (1.72)	0.62%*** (3.00)		-0.29% (-0.85)	-0.61%** (-2.07)	0.22% (0.75)
	Sell	0.46% (0.21)	1.02%* (1.51)	0.19% (0.6)		-0.34% (-0.39)	0.2% (0.06)
	Strong sell	-0.92% (-1.17)	2.49%*** (3.00)	0.28% (0.85)	0.02% (0.02)		-0.32% (-0.44)
	Initiation	0.04% (0.16)	-0.23% (-0.94)	-0.01% (-0.06)	-0.65%* (-1.5)	-0.12% (-0.29)	
	Stop	-0.59% (-1.12)	0.02% (0.04)	0.02% (0.06)	-0.88% (-0.66)	-0.75% (-0.83)	

Abnormal returns marked with asterisks are significant in a one-tailed test of whether the mean abnormal return of upgrades (downgrades) is significantly higher than (less than) zero.

Market participants generally reacted negatively to downgrades and positively to upgrades for high LFR recommendations, while initiations only produced positive ARs if the analysts issued a strong buy. Although strong sell to strong buy upgrades (strong buy to strong sell downgrades) with a high LFR only occurred 35 (48) times in the entire sample, the negative (positive) average CMAR and CRAR associated with this upgrade (downgrade) might indicate that a negative (positive) sentiment was still present concerning the specific companies even though the analysts issued a positive (negative) recommendation.

Cumulative ARs were generally negative or close to zero for analysts who stopped coverage and then issued high LFR recommendations. It might be that these analysts were ‘opportunistic’ by reacting to other analysts, but that they reacted too late during a period when many other analysts issued revisions. The high LFR, in this scenario, may be because of herding among analysts, and not because of new information that can influence price levels. The null hypothesis for Hypothesis 4.5, which implies that a high LFR recommendation will not have an abnormal price impact, can only be rejected for upgrades from strong sell and from hold to buy, and for downgrades from hold to strong sell. The rest of the revision categories did not generate statistically significant results, mainly due to small sample sizes.

Only hold- to buy- and strong sell- to buy upgrades and hold- to strong sell downgrades coincided with a statistically significant price reaction.

4.5 CONCLUSION

This chapter investigated the success of analysts in issuing recommendations that had a large abnormal price impact and initiated periods of heightened activity among other analysts.

A one per cent abnormal price movement was not found to be a rare event and it occurred often, while three and five per cent ARs occurred much less frequently. Analysts who were defined as 'active' had the highest incidence of influential recommendations when issuing strong buys; while their sell- and strong sell recommendations caused the least amount of abnormal price activity when compared to the other recommendation categories. This reaction to positive recommendations might be because many analysts issued the buy recommendations and the market trusted the consensus opinion of the analysts more when conveying buy opportunities compared to fewer analysts issuing warnings to sell specific shares. This result was also evident in the strong negative AR reaction of shares when analysts ended their coverage of the shares. Investors could benefit from this reaction to strong buys (stops) if they suspect that prices might react strongly when strong buy (stop) recommendations are issued and accompanied by enough credible information.

Recommendations that caused a large AR were followed by increased analyst activity when compared to the period before the recommendation was issued. The LFR for influential strong buys was lower than LFRs of other recommendation categories, possibly because of the high incidence of analysts issuing positive recommendations compared to negative recommendations. Extremely negative recommendations, in the form of strong sells, caused the greatest reaction by other analysts, who either downgraded or stopped their recommendations.

Where strong buys had the highest proportion of analysts issuing influential recommendations, the aforementioned increased activity among other analysts after strong sells showed an inverted pattern when comparing the two sets of results (Table 4.2 vs. Table 4.3). The increased activity and reaction of analysts therefore do not appear to mirror those of investors as reflected in abnormal price moves. All-in-all, recommendations followed by high analyst activity also coincided with strong short-term price reactions, indicating that investors could benefit during times of elevated analyst activity.

Now that questions have been investigated regarding how often analysts were successful in causing an AR-impact and how they may have influenced each other's activity, further tests regarding the traded volumes (as proxy for investor attention) and price volatility of each revision category are presented in Chapter 5.

The research questions covered in Chapter 4 are updated in Figure 4.4, and the abbreviated research questions of the next chapter presented in the left-hand side column (to be read from bottom to top).

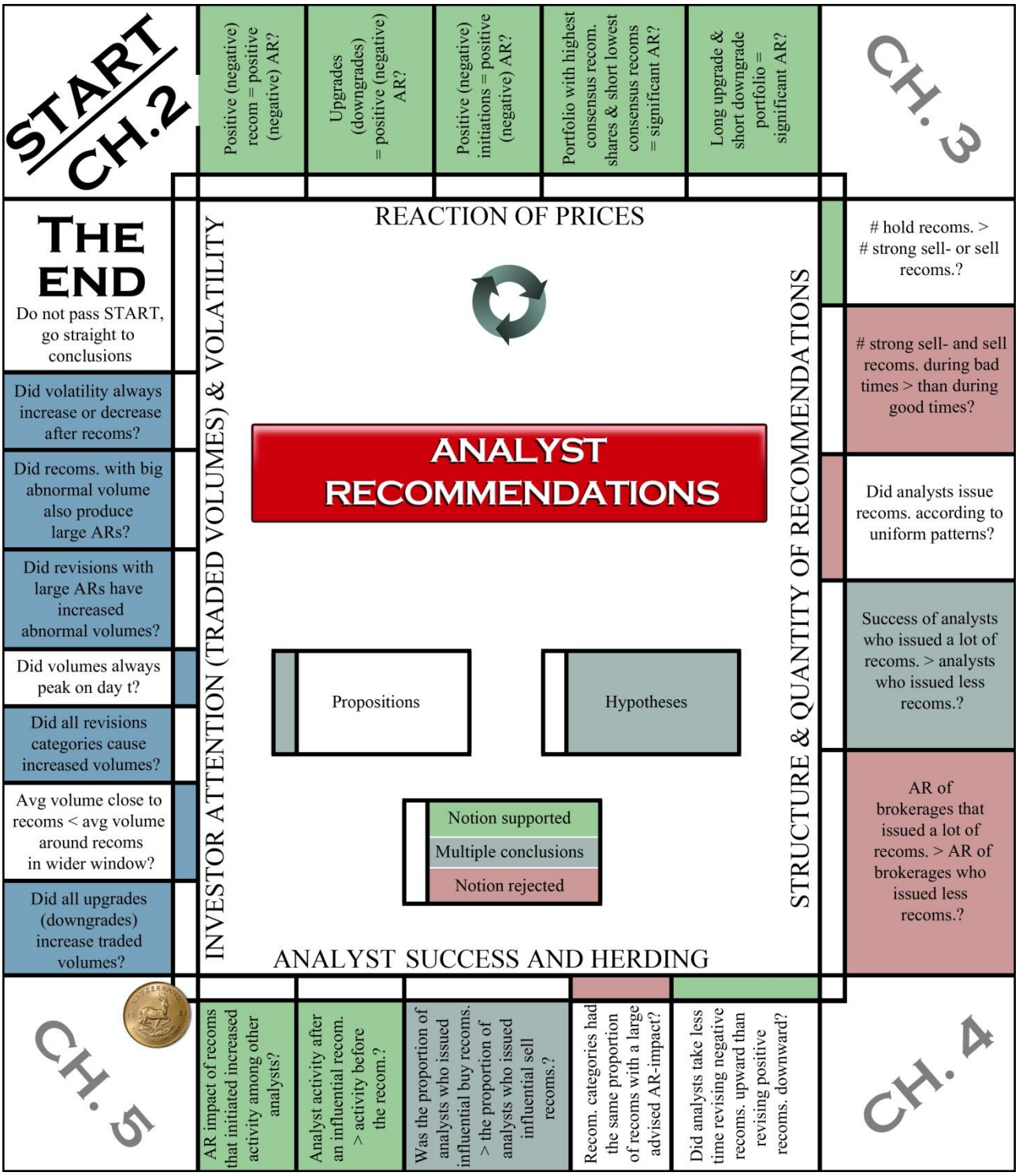

Figure 4.4: Game-board map of the study: Chapter 4

CHAPTER 5:
THE EFFECT OF NEW INFORMATION ON INVESTOR ATTENTION AND POST-RECOMMENDATION PRICE VOLATILITY

5.1 INTRODUCTION

The effects of the analysts' opinions extend further than merely potentially generating abnormal returns. As market participants collectively bargain to find new price levels, normal price volatility levels and traded volumes may also change following an influential recommendation. Herding may occur when many of the market participants roughly agree about the acceptable reaction to new information. Herding is broadly defined to be "the tendency of many different agents, who make their own individual decisions, to take similar actions at roughly the same time" (Jegadeesh and Kim, 2010:3).

The herding phenomenon among investors and analysts has been suggested to be caused by many factors: from an analyst trying to justify a higher fee by appearing more accurately aligned to consensus forecasts in the eyes of clients (Trueman, 1994), through to incentivisation schemes by the analysts' employers that could cause homogenous behaviour (Scharfstein and Stein, 1990). The incentivisation influences analysts when their 'ratings' in the company may influence their salaries and bonuses, causing the analysts to not want to risk an away-from-consensus opinion that turns out to be wrong, thereby negatively influencing the analysts rating relative to those of his or her peers. Scharfstein and Stein (1990) aptly called the aforementioned herding the 'sharing-the-blame' effect because an analyst will rather 'hide' in a group who made a misjudgement collectively. Research studies have found herding- and anti-herding behaviour among analysts (for a herding model, see Trueman, 1994; for an anti-herding model see Chen and Jiang, 2006). A change in analysts' collective opinion will form a new consensus recommendation level, which in turn might cause a homogenous reaction by investors if the new information from the analysts on a company's future stock price and earnings appreciation potential is deemed both credible and noteworthy.

New information generated and released by analysts is often publicly available, and would instantly be reflected in prices along with all other public information under the strong form of the market efficiency theory (Fama, 1970). Contrary to the efficiency theory, not all investors are instantly aware of new information, able to interpret new information themselves, or fully exempt from the various behavioural biases that can be present when making decisions. This leads to non-professional investors over-relying on analyst recommendations when deciding to trade (Kelly *et al*., 2012). Less sophisticated investors may also take longer to process and act upon new

information as they might not be able to react immediately or may be waiting to see how others react to new information.

For new price levels to be achieved, foreign and local investors would need sufficient liquidity in the market to trade around the new consensus opinion price levels. The depth of the market and resilience in the prices would influence how long it takes for the market to reach new price levels (Coppejans *et al.*, 2004). If sufficient liquidity exists and trading occurs instantaneously, new price equilibriums will be reached quickly and be reflective of the prevailing opinion.

The theoretical framework systematically explains why and how market participants react to new information, as well as some of the possible problems associated with investors' reliance on other people's interpretation of information. Literature on how traded volume and volatility reacted to information in the past is also presented, and their relationship with expected returns explained. The merit of investigating traded volume changes over the short term is also explained. After the literature review and research methodology, a discussion of the results and conclusions concerning investor attention is presented. The results indicate that herding behaviour may exist among investors following analyst recommendations, provided that sufficient liquidity is present in the market.

5.2 LITERATURE REVIEW

Analyst recommendations have been widely shown to influence investors to reconsider share prices to different degrees across recommendation categories, countries and sectors. While recommendation revisions have been suggested to cause the largest abnormal returns by most researchers (i.e. Stickel, 1995; Barber *et al.*, 2001), recommendation initiations have conversely also been shown to have had the greatest effect on prices (Irvine, 2004). The magnitude of the abnormal returns generated by analyst recommendations was also greater in the USA than in the other G7 countries (Jegadeesh and Kim, 2006), while six of 59 US industries did not deliver a significant long-short portfolio abnormal return (Boni and Womack, 2006). The degree to which analyst recommendations impact share prices may therefore vary depending on how the new information is received by market participants across different spheres.

5.2.1 Investor reaction to new information

The information offered to the market by analysts is suggested to be new information and available to the whole market (Hanousek and Kopřiva, 2013). While the new information may affect all market participants' opinions, the 'differences of opinion' theory (Harris and Raviv, 1993) implies that agreement cannot always be reached concerning the magnitude of the effect that the new information should have on share prices. The interpretation of the new information is assumed to be

asymmetric under the 'differences of opinion' theory, and Harris and Raviv (1993:474) further stated that each trader is assumed to believe "absolutely in the validity of his or her opinion". A variety of judgments and timing of reactions should therefore be expected among professional and non-professional investors.

The type of information received by market participants is the main factor that can cause price changes over time (Vega, 2006), with non-financial information often being a main driving force for analysts' and investors' reactions (Kerl *et al*., 2012). Vega (2006) further noted that volatility of returns is positively correlated with the media coverage received and the number of analysts covering the share. The more analysts disagreed about forecasts, the higher the media attention the company received became.

The reliance of investors on analysts' opinions will differ according to the degree to which an investor believes in his or her own ability to process information relative to the analyst's ability to form credible new information. Retail investors who do not have specialist knowledge may therefore be more prone to reacting to new information published by analysts, and may follow the recommendations more frequently (Hanousek and Kopřiva, 2013).

5.2.2 Traded volumes and volatility reactions

The impact of an analyst's opinion can only be measured if investors are able to execute a trade at a new price. A combination of willing and able buyers or sellers and sufficient liquidity in the market is required, hence the definition of market depth as the "order flow necessary to move price by a given amount" (Coppejans *et al.*, 2004:3). Liquidity in the form of traded volume is therefore the vehicle to integrate new information into asset prices (Chordia and Swaminathan, 2000), and traded volumes must therefore be present together with changes in share prices, irrespective of the direction of the price change (Kandel and Pearson, 1995). Share prices of companies that have low traded volumes should therefore be expected to "respond more slowly" (Chordia and Swaminathan, 2000:913) to the release of new information than shares with higher traded volumes.

Traded volumes are normally positively related to the arrival of new information (He and Wang, 1995), and have been proven to be an acceptable proxy for investor attention (Lee and Swaminathan, 2000; Loh, 2010). The reaction to new information is believed to not always be instantaneous or homogonous among investors. An over-focus on macro-economic news may cause investors to neglect new company-specific information (Peng and Xiong, 2006), while the share prices of companies with low traded volumes also take longer to react to new information (Loh, 2010). The distractions that accompany weekends have even been demonstrated to cause 'investor inattention' on Fridays (DellaVigna and Pollet, 2009).

Considerable noise in the price changes can also be expected to coincide with the arrival of new information as heterogeneous market participants trade in reaction to the amount of attention they give to company-specific news. New public information would normally coincide with both higher price volatility and traded volumes, but new private information would normally only coincide with increased traded volumes. However, abnormal price volatility levels do not accompany periods of high volumes that are driven by existing information (He and Wang, 1995).

5.2.3 Recommendations, traded volumes and volatility: international evidence

Palman, Sun and Tang (1994) investigated the volume-impact of recommendations published in a leading newspaper in a pre-internet environment after Liu, Smith, and Syed (1990) and Davies and Canes (1978) proved that recommendations published in the particular newspaper did induce an abnormal price reaction in share prices. Palman *et al.* (1994) were the first to propose a methodology where traded volumes associated with buy- and sell recommendations can be investigated separately, and found that traded volumes increased for buy recommendations only and not for sell recommendations.

Jegadeesh and Kim (2006) conducted a similar study to that of Palman *et al.* (1994), and proposed the use of standardised volumes (SVs) as a proxy for abnormal traded volumes. An SV divides a specific day's traded volume by the average volume over a longer period; Jegadeesh and Kim used the 20 days prior and the 20 days after recommendations as the average-volume window (see Section 5.3.1, Equation 5.1). Furthermore, instead of grouping all recommendations under only using buys and sells like Palman *et al.* (1994) did, Jegadeesh and Kim (2006) calculated the average SV for all upgrades and downgrades collectively for each day during the ten days prior and the ten days after recommendations were issued to compare the volume reactions across the different G7 countries. The result of their investigation is presented in Figure 5.1.

The volume reaction in the US was by far the strongest among the G7 countries, while Italy's analysts induced the smallest reaction among investors. The SV reaction in Italy was further only significant on day t-1 and day t while the other countries' SVs were significantly different from one on day t+1 as well. Japan proved to be the only country where downgrades' SV reaction was higher than that of the upgrades. Palman *et al.*'s (1994) finding that negative recommendations did not produce abnormal traded volumes was also not replicated for any of the G7 countries. Different countries therefore had different recommendation-volume interactions.

Chen, Firth and Rui (2001) compared the tri-part relationships between price movements, traded volumes and price-volatilities of shares in different markets. Chen *et al.* (2001:153) firstly noted that abnormal traded volumes contain information content for investors over and above that which can be seen in abnormal price movements, and further found that "for some countries, returns cause

volume", and that "volume causes return" for other countries by using a Granger causality test. While Chen *et al.* (2001) showed that volatility levels persisted after information events in nine different markets, Girard and Biswas (2007) found that volatility persistence decreased after information caused abnormal traded volumes.

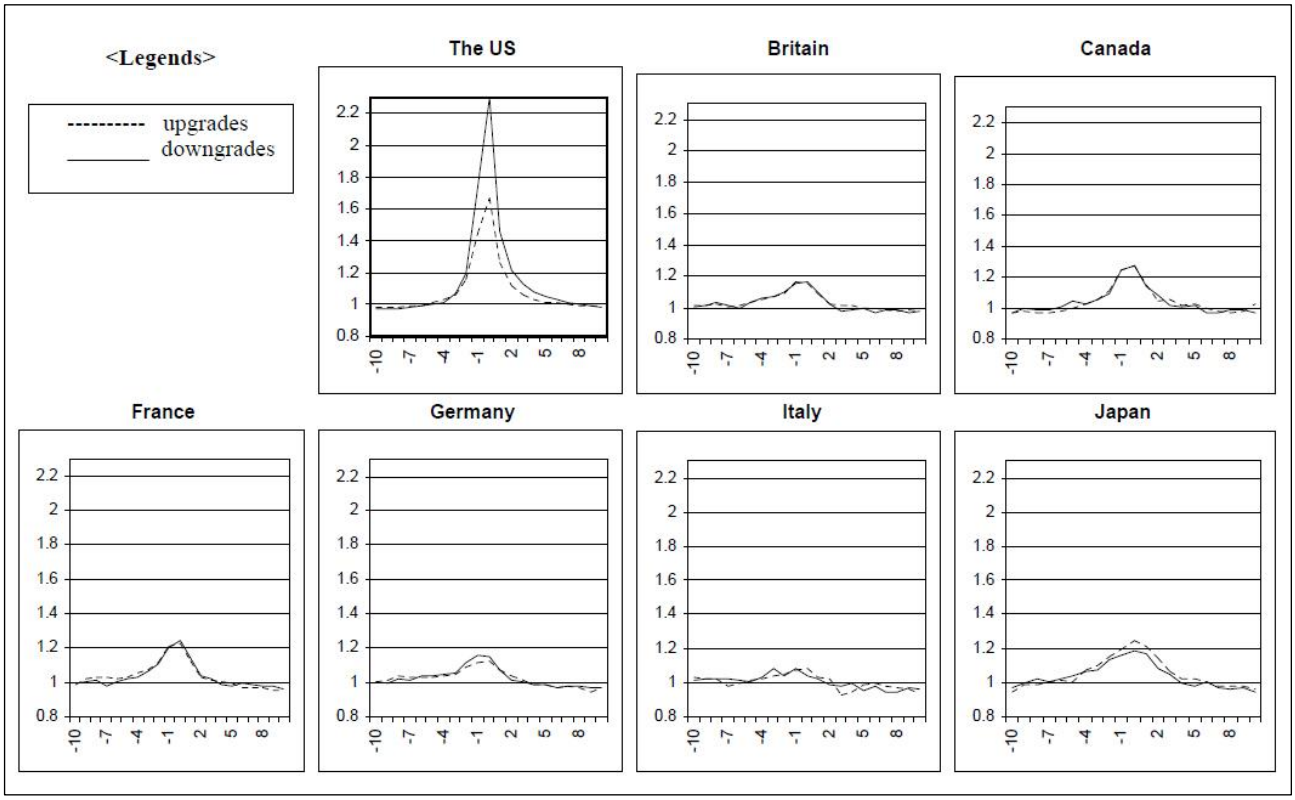

Figure 5.1: Average SVs around recommendations in the G7 countries

Source: Jegadeesh and Kim, 2006.

5.2.4 Private and public information

Insider trading might also cause traded volume increases prior to large price movements that coincide with company-related news and announcements (Thaver and Ward, 2011). Unfortunately, only 25 per cent of developing markets with insider trading rules have a record of prosecuting offenders, while 82 per cent of developed markets prosecute individuals guilty of insider trading (Bhattacharya and Daouk, 2002). Thaver and Ward (2011) reported that only one conviction of insider trading has been made in the Republic of South Africa, leaving a question mark about the country's analysts' integrity surrounding events associated with increased volumes. The analysts are either very honest or the systems to catch out any misdoings are not in place or not working effectively.

While increased volume before news events could be questioned, investors would naturally pay more attention to analysts who they regard to have superior information, and their reliance would in

turn lead to higher traded volumes that are completely legal (Jegadeesh and Kim, 2006). Analysts may be tempted to benefit from this trust relationship, issuing upward-biased recommendation revisions to influence traded volumes and in turn, increase the trading fees received by brokerage houses associated with the analyst (Morgan and Stocken, 2003).

Analysts who frequently change their recommendations sometimes offer greater value for investors than less active analysts, and the ability of these analysts to generate accurate recommendations from observing news, investors and traded volumes can be classified as 'skill' (Hobbs *et al*., 2012). These skilful analysts often successfully issued recommendations with a significant impact shortly after increases in volume occurred.

The investor who reacts to new information is not always the entity that executes the physical trade, but traders are often employed to handle the physical transaction. Traders who are allowed to time their trades would instinctively choose to have their trades coincide with periods of higher traded volumes, causing a type of herding or clustering of executable trades. These periods of high volumes are in turn used by noise or liquidity traders to mask the execution of large trades for institutional clients (Admati and Pfleiderer, 1988). A trader that breaks up a large order into smaller trades over time can therefore also have a prolonged influence on volumes and price volatility.

5.2.5 Divergence among analyst opinions

Although some analysts have been demonstrated to herd (Jegadeesh and Kim, 2010), a divergence in their opinions and behaviour can also occur, especially between dependent and independent analysts (O'Brien, McNichols and Lin, 2005; Barber *et al*., 2007). Abnormal traded volume has been demonstrated to be a proxy for divergent opinions following earnings announcements (Garfinkel and Sokobin, 2006). The volume proxy for divergence in opinion can even be used as a risk factor when assessing returns (Varian, 1985).

While larger capitalisation shares' liquidity and volatility are normally quite predictable, smaller capitalisation shares' "liquidity and volatility vary randomly in time" (Almgren, 2012:164). Shares with a high risk-adjusted standard deviation, called idiosyncratic volatility, also tend to have a low average return over time (Ang, Hodrick, Xing and Zhang, 2009).

New information offered by analysts is therefore expected to not only have an abnormal return impact, but also an increased traded volume associated with credible recommendations. Higher traded volumes in turn indicate market depth and liquidity. This chapter uses traded volume as proxy for investor attention and analyst recommendation revisions as a proxy for new information. The individual research questions addressed in the study are as follows:

(i) Did investor attention increase with the release of new information?

(ii) Were there specific positive or negative information events that had a greater impact on investor attention than other signals?

(iii) Did influential recommendations (recommendations that caused a big abnormal price impact) coincide with increased investor attention and *vice versa*?

(iv) Did analyst recommendation revisions have an impact on or change the prevailing share price volatility levels?

The next section describes how this study investigated the assumptions surrounding increased investor attention during times of new information flow.

5.3 DATA AND METHODOLOGY

This chapter mainly investigated the impact of recommendation revisions on traded volumes as an indication of investor attention. All companies that were listed on the JSE and companies that were covered by analysts during the sample period were included in the study to negate any survivorship- or size bias. Only recommendation revisions were used in this chapter of the dissertation as a proxy for information produced by analysts (similar to Jegadeesh and Kim, 2010). Hobbs *et al.* (2012) also support this methodological application of only using revisions because of the positive bias among analysts associated with initiations and the possible overtrading-effect of the positive bias on investors' trades.

Following Chen *et al.* (2001), the number of shares traded per share per day was used as a proxy for traded volume and hence an indication of investor attention. The term 'volume' is used in the rest of the chapter to refer to total daily trade activity. Traded volumes and changes in share price volatility around recommendation revisions are used as proxies for investor attention (following Loh, 2010).

Only recommendations with sufficient data for calculations were included in the calculations for this chapter. Some recommendations were therefore excluded from the available sample because, for instance, a 30-day standard deviation could not be calculated for a newly-listed share within the first month or for a delisted share within 30 days of delisting. The total number of eligible instances for each recommendation revision category was calculated and the results displayed in a table. The full sample from I/B/E/S contained 17 247 eligible recommendation revisions over the 1993 to 2011 period.

The annual distribution among the different recommendation categories was calculated to investigate how much positive and negative news analysts generated over the sample period. The proportions of the six most frequently-used revision categories were calculated as a percentage of total revisions per calendar year.

Hypotheses and propositions were identified from the existing literature. The hypotheses and propositions are listed below, followed by a brief description of the test(s) related to the specific hypothesis.

Hypothesis 5.1: On average, upgrades (downgrades) are associated with abnormal traded volumes over the short term.

Proposition 5.2: Investors on average trade less in the ten days directly surrounding a recommendation than over longer periods around the recommendation.

Investor attention and the change in investor attention were measured by calculating the standardised volume (SV) on the day before (day t-1), the day of (day t) and the day after (day t+1) each recommendation relative to specified window periods surrounding the recommendations to isolate liquidity spikes in reaction to new information entering the market. The average SV of all upgrade categories and all downgrade categories were calculated using the method proposed by Jegadeesh and Kim (2006), although two additional window periods were used in this study over and above the 20 days before plus 20 days after the recommendation implemented by Jegadeesh and Kim. Equation 5.1 was used for the calculation of an SV on day z (z = t-1, t or t+1) with a trade window of x days relative to a recommendation issued on day t:

$$SV_{x,z} = Volume_{day\ z} / (Average\ Volume\ day_{t-(x+1)..t-2;\ t+2..t+(x+1)}) \quad ...(5.1)$$

Five-day, ten-day (similar to Hanousek and Kopřiva, 2013) and 20-day (similar to Jegadeesh and Kim, 2006) trade windows before and after the release of new information were used for x respectively. The standardised volume was only denoted as SV_5, SV_{10} and SV_{20} when no differentiation was made between the three days around the recommendations. While Loh (2010) measured inattention by comparing low- vs. high attention shares to each other by measuring average volume prior to recommendations, the method proposed by Jegadeesh and Kim (2006) measured attention relative to the total activity that occurred around recommendations. The immediate attention generated by a recommendation was therefore standardised relative to both prior attention as well as a possible delayed attention by some investors.

Note that day t-1, day t and day t+1 were never included in the calculation of the average. Both the full sample and a sample excluding all recommendations that coincided with zero traded shares were analysed respectively. The sample excluding the illiquid shares was compiled because small capitalisation shares and illiquid shares do not always offer investors the market depth to reflect new information in prices. The full sample may therefore not be fully reflective of investor attention. Illiquid shares were defined as shares that had zero traded shares on the day of the recommendation due to any reason, and were excluded from some calculations to measure the effect on regularly traded shares.

Hypothesis 5.3: All revision categories cause a significant increase in investor attention.

Proposition 5.4: Investor attention (SV) will peak on the day that a recommendation is issued (Max [SVt-1 .. SVt+1] = SVt).

The average SV for day t-1, day t and day t+1 was calculated for the 20 individual upgrade- and downgrade categories respectively to measure if investor attention increases occurred around the announcement of recommendation revisions. While Jegadeesh and Kim (2010) ignored recommendations with a large SV, this study included the SV outliers but limited the maximum SV to 50 because the inclusion of the outliers skews the results to such an extent that the general patterns were affected significantly. Only 1.1 per cent of the total sample had an SV of more than ten. Two-tailed statistical significance tests were used to evaluate if the SV was significantly different from an expected, normal SV of one.

Chen *et al.* (2001) stated that abnormal volumes may sometimes lead abnormal returns, while abnormal returns may lead abnormal volumes at different times or in different countries. Following on Chen *et al.*, the next two hypotheses investigated the price-volume impact of revisions by controlling for high-impact prices and -volumes respectively.

Hypothesis 5.5: Recommendation revisions that cause large abnormal returns cause increased investor attention (traded volumes) as well (SV>1).

Hypothesis 5.6: Recommendations that cause above-average volume also produce significant abnormal returns.

Market-adjusted return (MAR) and risk-adjusted return (RAR) were used as indications of abnormal returns (AR). The SVs for all liquid recommendations were calculated for each of the five-point scale recommendation categories, for each of the possible ten upgrade categories and for each of the ten possible downgrade categories. The difference between a recommendation's SV on day t-1 and the maximum SV on day t or day t+1 was calculated to measure if an increase in traded volume occurred around recommendation issuances for each specific recommendation category.

Trade-day windows of five, ten and 20 days were used respectively to differentiate between immediate- and longer-term average liquidity.

The SV was calculated for recommendations that caused an average advised MAR or RAR of greater than three per cent or five per cent respectively to test if recommendations that generated large abnormal returns generally coincided with increased investor attention. A two-tailed statistical significance test was again implemented to evaluate if the SV was significantly different from an expected SV of one. The AR of recommendations that caused above-average market attention ($SV_5>1$) was also calculated on day t-1, day t and day t+1 to measure if abnormal price reactions coincided with the extra traded volumes. A two-tailed statistical significance test was again implemented to evaluate if the MARs and RARs were significantly different from zero.

Hypothesis 5.7A1: Price volatility will increase after recommendations are issued ($\sigma_{-31..-1} < \sigma_{1..31}$).

Hypothesis 5.7A2: Price volatility will decrease after recommendations are issued ($\sigma_{-31..-1} > \sigma_{1..31}$).

Price volatility after recommendations was compared to price volatility before the recommendations to investigate if the release of recommendations influenced the variability in returns. The standard deviation of returns was calculated as a proxy for price variability, and the standard deviation after each recommendation was subtracted from the standard deviation before the recommendation to measure if the volatility changed. The influence of outliers was again mitigated by limiting standard deviations to a maximum of 20 per cent instead of removing the values from the sample. Only 0.09 (0.07) per cent of the recommendations had an associated standard deviation of more than 20 per cent before (after) the recommendation was issued. Similar to Ang *et al.* (2009), the standard deviation of raw returns and market-adjusted returns were calculated over one-month windows before and after the recommendation. The change in standard deviation (ΔStDev) from the 30 days before the recommendation was compared to the same period after the recommendations for each recommendation using Equation 5.2:

$$\Delta StDev = Standard\ deviation_{(-30..-1)} - Standard\ deviation_{(0..29)} \quad ...(5.2)$$

The average ΔStDev for every recommendation category was subsequently calculated for raw returns and market-adjusted returns. Periods of sustained performance or price momentum would have a lower standard deviation than during periods where prices fluctuated normally. An average ΔStDev of more than zero would therefore indicate that the average standard deviation decreased after the recommendations and that the recommendations were followed by a period where

performance fluctuated less than before. Two-tailed t-tests were used to evaluate if the average change in volatility across all recommendations was significantly different from zero.

5.4 RESULTS AND DISCUSSION

The number of eligible instances for each recommendation's revision category that is included in this chapter is indicated in Table 5.1. In total, 17 247 revisions had sufficient data points before and after the revisions for this chapter's calculations.

Table 5.1: Number of recommendations per revision category

		To recommendation:				
		Strong buy (1)	**Buy (2)**	**Hold (3)**	**Sell (4)**	**Strong sell (5)**
From recommendation:	**Strong buy (1)**		532	2 278	196	284
	Buy (2)	559		2 401	243	61
	Hold (3)	2 214	2 319		1 511	960
	Sell (4)	179	253	1 458		250
	Strong sell (5)	269	72	954	254	

Analysts did not issue equal quantities of recommendations across the recommendation transition categories over the total period, but favoured certain revision categories. For instance, a revision from a buy to a hold (2 to 3) occurred 7.9 times more than revisions from buy to sell (2 to 4) and strong sell (2 to 5) put together. Upgrades from hold to buy (3 to 2) or strong buy (3 to 1) were by far the most popular upgrade categories, possibly reflective of a preference among analysts to rather issue positive recommendations. Downgrades to hold from buy (2 to 3) or strong buy (1 to 3) were also predominant categories, inferring that analysts may rather have issued a neutral signal than an outright negative recommendation, or that analysts may often have switched between hold recommendations and the two buy categories.

An average of about four analysts per share issued revisions over the November 1993 to December 2011 period, with a maximum of 25 analysts issuing recommendation revisions for a specific company. No revisions were issued during the last two months of 1993. In Figure 5.2 the six main revision categories per year are presented as a percentage of total revisions per calendar year.

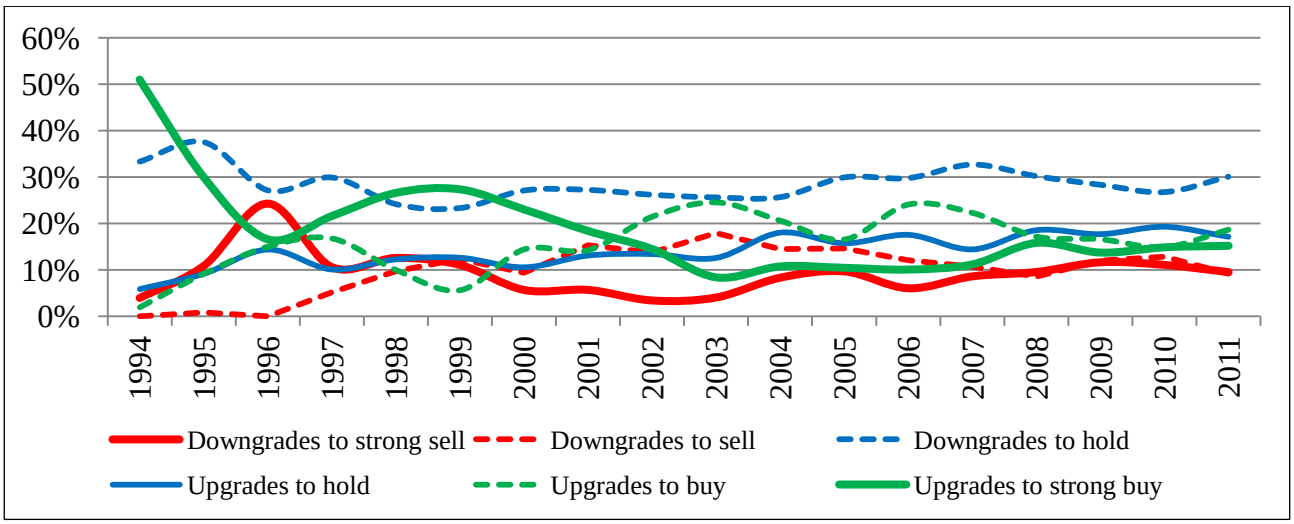

Figure 5.2: Distribution of main revision categories (1994-2011)

Similar to the results in Chapter 3's Table 3.1, analysts did not issue equal quantities of recommendation revisions per revision category per calendar year, with downgrades to hold being the preferred revision category over most of the sample. An inverted movement is visible between the strong buy and buy upgrades from 1994 to 2004, but the inverted movement disappears from 2005 onwards.

The first research question was whether new information in the form of broadly-classified positive and negative information coincided with increased investor attention. The average SVs surrounding all upgrade- and downgrade recommendation categories are displayed in Table 5.2.

Table 5.2: Average standardised volume reaction to all upgrades and downgrades

		All recommendations			Illiquid shares excluded		
	Day (z)	**SV_5**	**SV_{10}**	**SV_{20}**	**SV_5**	**SV_{10}**	**SV_{20}**
All upgrades	**t-1**	1.08*** (3.01)	0.99 (-0.6)	0.94*** (-3.3)	1.24*** (7.8)	1.13*** (5.12)	1.07*** (3.32)
	t	1.16*** (5.48)	1.04 (1.61)	1.00 (-0.21)	1.30*** (9.11)	1.16*** (6.18)	1.11*** (4.88)
	t+1	1.16*** (5.09)	1.04* (1.77)	1.01 (0.32)	1.32*** (9.16)	1.19*** (6.69)	1.15*** (5.64)
All downgrades	**t-1**	1.11*** (3.94)	1.01 (0.24)	0.97 (1.41)	1.28*** (8.67)	1.16*** (6.59)	1.12*** (5.38)
	t	1.14*** (4.94)	1.04 (1.59)	1.00 (0.05)	1.28*** (9.07)	1.16*** (6.43)	1.12*** (5.24)
	t+1	1.19*** (6.17)	1.09*** (3.24)	1.04 (1.47)	1.35*** (10.07)	1.23*** (7.74)	1.18*** (6.34)

Results that are significantly different from an SV of one for a two-tailed test are marked with asterisks. The test statistics are indicated in brackets.

The first pattern that demands attention is that the SVs for the sample excluding the illiquid shares were higher than the SVs when the illiquid shares were included. The SVs for downgrades and upgrades increased in a similar fashion across both samples from day t-1 to day t and from day t to day t+1. The comparable increase in volumes around upgrades and downgrades appears to reflect increased attention from investors, irrespective of the sentiment portrayed by the recommendations or coinciding information flows. The increased trading on day t-1 could indicate speculative trading the day before the announcements, or that private information was actively traded upon to cause the increase in short-term volumes on day t-1 (in line with He and Wang, 1995) before the information was only made public on day t.

The average SV on day t+1 was the highest across all the SVs for the tradable sample, indicating that investors had generally traded more on day t+1 than the two prior days. The possible explanations for this phenomenon centre on the delay in making decisions within certain investment structures or environments, and on delays in information distribution. Delayed decisions can occur for many reasons: Larger trades by a single entity or fund might possibly only be agreed upon by trading- and investment teams during the meetings on day t+1; the counterparties to each trade on day t+1 might have waited to see if the market reacted to the news; and some investors might spread a trade over the period of two or three days to either speculate or not trade too many shares relative to the normal traded volumes.

All SVs in the sample excluding the illiquid shares were highly significantly different from one and especially high when comparing traded volumes over a short-term window to the longer-term windows. Market attention, as proxied by traded volumes, therefore changed and increased around the new information events in the sample, and the increased volumes were not limited to the day of the information event. The null hypothesis for Hypothesis 5.1 can therefore be rejected, and the notion of increased volumes around both upgrade- and downgrade revisions is supported.

Another pattern that emerged was that the average SV always decreased from SV_5 to SV_{10} and again from SV_{10} to SV_{20}; indicating that the denominator in Equation 5.1 increased as the window was widened. Market participants therefore generally traded less on average during the ten days surrounding SV_5 than during the 40 days' average measured in SV_{20}, possibly in anticipation of various information events, in support of Proposition 5.2. This might have occurred because of two main reasons: either investors were expecting news and did not trade in the five days before and after the recommendation; or other information flows pushed up volumes in the greater than five days windows.

The next research question addressed is whether specific recommendations' revision categories had a greater impact on investor attention? The SVs for different upgrades and downgrades are shown

in Table 5.3. Results that are statistically significantly different from one at the 10%, 5%, and 1% levels are marked with an *, #, and + respectively.

The information generated by analysts in the 20 different upgrade and downgrade categories did not have an equal effect on investor attention. The unweighted average SV_5 across all upgrades (downgrades) on day t was 1.36 (1.32), followed by an average SV_5 of 1.30 (1.37) on day t-1. Of the 20 upgrade and downgrade categories, 12 categories produced the lowest SV_5 on day t-1, five on day t and three on day t+1. The pattern was the same for SV_{10} and SV_{20}. Investors could therefore expect sufficient liquidity on the day of- and the day after recommendations, and can use the extra liquidity to avoid trade delays and higher intrinsic costs if they are able to trade quickly. Upgrades to hold (5 to 3 and 4 to 3), upgrades from hold (3 to 1 and 3 to 2) and positive to extremely positive upgrades (2 to 1) generated statistically significant volumes on day t-1, day t and day t+1. Moves from a negative to neutral sentiment and neutral to positive sentiment thus triggered a longer and more significant volume reaction than information that conveyed a negative to positive sentiment.

While an upgrade from strong sell to strong buy only caused significant volume on day t, the market reacted strongly across all three days when analyst sentiment swung from extremely positive to extremely negative (1 to 5). Strong volume reactions accompanied all of the negative news events, although some of the categories did not have large enough samples to confirm statistical significance. The market participants thus broadly deemed negative analyst opinions as a signal to trade and maybe to unwind positions for profit taking. Together with the results showing that not all upgrades generated significant abnormal volumes, Hypothesis 5.3's notion that all revision categories caused an increase in investor attention cannot be supported.

Only two (two) out of the 10 upgrade (downgrade) categories coincided with maximum traded volumes on day t-1, and only strong sell to buy (5 to 2) had a large difference between day t-1 and the maximum of day t and day t+1. Market attention therefore generally did not peak before the new information was produced, although the increased SVs indicated that the market was already acting on new information by the time most recommendations were issued. The high abnormal traded volumes on day t-1 may also be because other analysts had already disseminated a certain sentiment to the market. Generally, the increased SVs indicate that the consensus opinion was either changing or that disagreement about price levels existed around recommendations. Of the ten possible upgrade (downgrade) categories, only three and five (two and six) categories had the highest SV on day t and on day t+1 respectively. Eleven revision categories' SVs peaked on day t+1 in total, versus five on day t and four on day t-1, pointing to a rejection of Proposition 5.4's concept that all revisions' SVs will peak on the day the recommendation is issued.

Table 5.3: Standardised volume for recommendations with traded volume greater than zero

	Upgrades										Downgrades										# categories with SV lower than 1	# categories where volume peaked on day
5 days	**5..1**	**5..2**	**5..3**	**5..4**	**4..1**	**4..2**	**4..3**	**3..1**	**3..2**	**2..1**	**1..5**	**1..4**	**1..3**	**1..2**	**2..5**	**2..4**	**2..3**	**3..4**	**3..5**	**4..5**		
t-1	1.26 *	1.33	1.18 #	1.45	1.55 #	1.13	1.23 +	1.25 +	1.2+	1.36 #	1.52 #	1.23	1.33 +	1.29 #	1.29	1.09	1.19 +	1.27 +	1.39 +	1.45 *	0	4
t	1.37 #	1.03	1.22 +	1.96 #	1.59	1.3	1.45 +	1.26 +	1.2+	1.22 #	1.28 #	1.4*	1.35 +	1.38 #	1.68	1.13	1.2+	1.21 +	1.32 +	1.25 #	0	5
t+1	1.18	0.8	1.38 +	1.36	1.61 *	1.47 #	1.28 +	1.31 +	1.31 +	1.33 #	1.37 +	1.44 *	1.44 +	1.37 #	1.35	1.14 *	1.29 +	1.26 +	1.42 +	1.59 #	1	11
Max(SV $_{5,t}$, SV$_{5,t+1}$)- SV$_{5,t-1}$	0.11	-0.30	0.20	0.51	0.06	0.34	0.22	0.06	0.11	-0.03	-0.15	0.21	0.11	0.09	0.39	0.05	0.10	-0.01	0.03	0.14		4

Table 5.3: Standardised volume for recommendations with traded volume greater than zero (continued)

10 days	**5..1**	**5..2**	**5..3**	**5..4**	**4..1**	**4..2**	**4..3**	**3..1**	**3..2**	**2..1**	**1..5**	**1..4**	**1..3**	**1..2**	**2..5**	**2..4**	**2..3**	**3..4**	**3..5**	**4..5**		
t-1	1.25 *	0.96	1.09 *	1.11	1.23	1.02	1.14 #	1.13 #	1.11 #	1.25 *	1.4#	1.1	1.17 +	1.15 *	1.22	1.04	1.11 +	1.15 #	1.21 +	1.18	1	5
t	1.23	0.91	1.17 #	1.32 #	1.32	1.25	1.31 +	1.08 #	1.11 #	1.1	1.14	1.27	1.18 +	1.26	1.51	0.97	1.13 +	1.15 +	1.18 #	1.24 #	2	4
t+1	1.11	0.78	1.24 +	1.37	1.43	1.47 *	1.17 +	1.13 +	1.19 +	1.2#	1.28 #	1.06	1.25 +	1.16	1.15	1.07	1.23 +	1.17 +	1.34 +	1.53 *	1	11
Max($SV_{10,t}$, $SV_{10,t+1}$) - $SV_{10,t-1}$	-0.02	-0.05	0.15	0.26	0.20	0.45	0.17	-0.00	0.08	-0.05	-0.12	0.17	0.08	0.11	0.29	0.03	0.12	0.02	0.13	0.35		5
20 days	**5.1**	**5.2**	**5.3**	**5.4**	**4.1**	**4.2**	**4.3**	**3.1**	**3.2**	**2.1**	**1.5**	**1.4**	**1.3**	**1.2**	**2.5**	**2.4**	**2.3**	**3.4**	**3.5**	**4.5**		
t-1	1.24 *	1	1.08	1.03	1.16	0.97	1.07	1.06	1.06	1.12	1.36 *	1.04	1.12 +	1.16 *	1.2	1.06	1.09 #	1.08 *	1.2+	1.1	1	4
t	1.14	0.93	1.17 #	1.24 *	1.11	1.22	1.23 +	1.03	1.07	1.08	1.05	1.24	1.13 +	1.23	1.6	0.98	1.08 *	1.13 #	1.16 #	1.2	2	5
t+1	1.01	0.8	1.21 +	1.24	1.4	1.45 *	1.13 #	1.09 *	1.15 +	1.11	1.17	1.02	1.18 +	1.13	1.1	1.12	1.18 +	1.14 #	1.27 +	1.2	1	11
Max($SV_{20,t}$, $SV_{20,t+1}$) - $SV_{20,t-1}$	-0.10	-0.07	0.13	0.21	0.24	0.48	0.16	0.03	0.09	-0.01	-0.19	0.20	0.06	0.07	0.40	0.06	0.09	0.06	0.07	0.10		4

Another consideration was if recommendation revisions that caused pronounced abnormal returns corresponded with increased traded volumes as well. The SVs that coincided with large advised abnormal returns on day t and day t+1 are shown in Table 5.4.

Table 5.4: Average SV of influential recommendations

Threshold:		**MAR > 3%**		**MAR > 5%**		**RAR > 3%**		**RAR > 5%**	
Trade day:		**Day t**	**Day t+1**	**Day t**	**Day t+1**	**Day t**	**Day t+1**	**Day t**	**Day t+1**
SV_5	**t-1**	1.3*** (8.06)	1.33*** (8.57)	1.25*** (4.87)	1.43*** (5.44)	1.29*** (7.12)	1.34*** (7.57)	1.33*** (4.76)	1.36*** (4.57)
	t	1.47*** (10.13)	1.36*** (9.01)	1.52*** (6.86)	1.46*** (5.85)	1.38*** (8.22)	1.36*** (7.86)	1.39*** (5.08)	1.37*** (4.68)
	t+1	1.4*** (9.29)	1.46*** (10.53)	1.5*** (6.11)	1.62*** (7.13)	1.41*** (8.53)	1.43*** (8.9)	1.46*** (5.55)	1.47*** (5.61)
SV_{10}	**t-1**	1.19*** (6.02)	1.21*** (6.73)	1.16*** (3.7)	1.29*** (4.54)	1.17*** (5.06)	1.2*** (5.59)	1.18*** (3.35)	1.2*** (3.28)
	t	1.32*** (8.03)	1.23*** (6.82)	1.39*** (5.61)	1.32*** (4.81)	1.26*** (6.09)	1.24*** (5.71)	1.26*** (3.7)	1.24*** (3.38)
	t+1	1.28*** (7.32)	1.33*** (8.48)	1.36*** (5.08)	1.47*** (5.97)	1.28*** (6.64)	1.29*** (6.88)	1.3*** (4.34)	1.31*** (4.38)
SV_{20}	**t-1**	1.14*** (4.74)	1.15*** (5.44)	1.1*** (2.55)	1.24*** (3.91)	1.13*** (3.96)	1.15*** (4.42)	1.13*** (2.49)	1.15*** (2.58)
	t	1.24*** (6.67)	1.19*** (5.65)	1.3*** (4.76)	1.28*** (4.4)	1.2*** (5.07)	1.18*** (4.76)	1.19*** (2.99)	1.19*** (2.83)
	t+1	1.23*** (6.14)	1.28*** (7.3)	1.29*** (4.47)	1.41*** (5.37)	1.22*** (5.67)	1.23*** (5.86)	1.24*** (3.7)	1.26*** (3.78)
	n	5 670	6 040	2 088	2 142	4 901	4 759	1 948	1 783

Results that are statistically significant in an upper-tailed test are marked with asterisks. The test statistics are indicated in brackets.

The average increase in traded volumes was strongly significant for all revisions that produced a large average abnormal return impact. In support of the pattern seen in the overall results in Table 5.3, the abnormal traded volumes generally increased from day t to day t+1. A greater measure of investor attention therefore coincided with large abnormal returns in support of the claim presented in Hypothesis 5.5.

The SVs across the board increased slightly when comparing the five per cent RARs to the three per cent RARs. The MARs varied more than the RARs when comparing the three per cent category to the five per cent category. Increases and decreases in SVs occurred throughout and no discernible pattern could be identified.

The large price moves that coincided with higher traded volumes lead to the inference that the information that caused the movements was public in nature. The market reacted to news and produced increased risk-adjusted return and increased volume, with some momentum seemingly present over the short term when investors believe in the credibility of new information.

While the previous research question investigated the average SV of influential recommendations, the next research question investigated whether all the recommendations that coincided with an above-average SV_5 also produced significant abnormal returns. The average MARs and RARs for information events with above-average SV_5's are displayed in Table 5.5.

Table 5.5: Average ARs of recommendations with above-average SV

	Upgrades			**Downgrades**		
	t-1	**t**	**t+1**	**t-1**	**t**	**t+1**
Average SV_5	1.082	1.162	1.156	1.113	1.135	1.193
Average of SV_5>1	1.241	1.298	1.317	1.282	1.275	1.354
MAR_t	0.23%*** (3.61)	0.25%*** (3.34)	0.20%*** (2.81)	-0.14%** (-2.26)	-0.21%*** (-2.77)	-0.19%*** (-2.57)
MAR_{t+1}	0.14%** (2.17)	0.11%** (1.66)	0.27%*** (3.76)	-0.01% (-0.22)	-0.04% (-0.66)	0.05% (0.74)
n_{MAR}	2038	1834	1759	1992	1930	1781
RAR_t	0.23%*** (3.61)	0.25%*** (3.36)	0.23%*** (3.18)	-0.14%*** (-2.4)	-0.22%*** (-3.08)	-0.18%*** (-2.55)
RAR_{t+1}	0.12%** (1.90)	0.09%* (1.41)	0.22%*** (3.2)	-0.09% (-1.41)	-0.09% (-1.41)	0.01% (0.10)
n_{RAR}	1 983	1 789	1 716	1 950	1 891	1 739

Results that are statistically significant in an upper-tailed test are marked with asterisks. The test statistics are indicated in brackets.

The above-average SV_5s exceeded the full sample's average SV_5 by approximately 0.15 over all the revision categories. Recommendation revisions that proved to generate above-average market attention on day t-1, day t and day t+1 also generated a significant MAR_t and RAR_t for upgrades and downgrades. Both the MAR_{t+1} and RAR_{t+1} were only significant at the five per cent level on day t+1 for upgrades with an above-average $SV_{5,t+1}$, and never for downgrades. Downgrades with large traded volumes therefore incurred most of the negative AR on the day of the release of the new information, while upgrades with large traded volumes proved to have some abnormal price momentum on day t+1.

Hypothesis 5.6 is therefore supported for ARs on day t, but not for ARs on day t+1. Price adjustments that happened quickly and were not part of sustained price momentum periods therefore generally seem to have increased volumes associated with them for both upgrades and downgrades.

The last question addressed in this chapter investigates if greater prolonged agreement concerning the direction of prices or price levels occurred around recommendation revisions. The results of the test of reduced risk after the release of new information are displayed in Table 5.6.

Table 5.6: Difference in average price volatility from before the recommendation

Panel A: Average 30-day standard deviation of raw returns

		To recommendation:				
		Strong buy	**Buy**	**Hold**	**Sell**	**Strong sell**
From recommendation:	**Strong buy**		0.01% (0.18)	0.09%*** (2.87)	0.22%* (1.38)	0.14%* (1.29)
	Buy	0.01% (0.21)		0.02% (0.61)	0.13%* (1.31)	0.31%* (1.45)
	Hold	0.02% (0.63)	0.04%** (1.74)		0.09%** (2.29)	0.02% (0.46)
	Sell	-0.04% (0.23)	0.10%* (1.56)	0.05%* (1.30)		0.30%*** (2.73)
	Strong sell	-0.04% (0.37)	-0.06% (0.28)	0.01% (0.15)	0.33%*** (2.71)	

Panel B: Average 30-day standard deviation of market-adjusted returns

		To recommendation:				
		Strong buy	**Buy**	**Hold**	**Sell**	**Strong sell**
From recommendation:	**Strong buy**		-0.01% (0.17)	0.08%*** (2.6)	0.16% (1.05)	0.11% (1.12)
	Buy	0.02% (0.38)		0.02% (0.84)	0.12% (1.25)	0.3%* (1.53)
	Hold	-0.01% (0.16)	0.03%* (1.57)		0.10%*** (2.81)	0.03% (0.64)
	Sell	-0.05% (0.36)	0.04% (0.84)	0.06%** (1.72)		0.29%*** (2.85)
	Strong sell	-0.08% (0.74)	-0.14% (0.64)	0.03% (0.69)	0.30%*** (2.49)	

The standard deviation after each revision was subtracted from the standard deviation before the revision ($\sigma_{-31..-1} - \sigma_{1..31}$). A positive average difference indicates a reduction in price volatility. Averages that are significant in a one-tailed test are indicated with asterisks.

The average 30-day standard deviation decreased significantly for selected recommendation categories, possibly indicating a form of momentum in the share's return, or general agreement about the direction of prices among market participants after the new information was issued by analysts. The raw return standard deviations for downgrades (upgrades) decreased by 13 (four) basis points on average, while the MAR standard deviations for downgrades (upgrades) decreased by 12 (two) basis points on average. The market generally seemed to agree more about price levels or the direction of prices after downward revisions than after upward revisions, except for the raw return standard deviation (MAR standard deviation) of three (four) upgrade revision categories, which increased after the revisions were issued.

Of the 20 revision categories, only four produced statistically significant changes in raw- and market-adjusted average price volatility at the five per cent level. Three of these significant categories included one-step changes in recommendations, while the strong buy to hold (5 to 3) recommendations signified a two-step change. The largest decrease in price volatility surrounded revision toggling between the two most negative recommendation categories, maybe indicating that investors shared a similar opinion about the direction of price changes. Although Hypothesis 5.7_{A2}'s statement that price volatility will decrease after revisions are issued can be supported at the five per cent level for four revision categories across both samples, the overall results show only weakly significant reductions in volatility. All-in-all, the remark by Girard and Biswas (2007) that new information flows may decrease volatility persistence of raw returns proved true for 17 out of 20 revision categories, with 11 of the 17 revision categories showing some level of statistically significant reduction in volatility.

The large upward revisions in three upgrade categories (5 to 1, 4 to 1 and 5 to 2) caused increased volatility in raw- and market-adjusted returns, indicating either a disagreement about price levels among market participants (He and Wang, 1995) or a staggered reaction in terms of market attention by investors only reacting to new information later (Loh, 2010). None of these returns were significantly different from zero, and the null hypothesis for Hypothesis 5.7_{A1} should therefore not be rejected.

5.5 CONCLUSIONS

This chapter provided evidence that investor attention increased over the short term when analysts issued recommendations for shares that had sufficient liquidity for investors to execute their trades. Investors on average traded less during the ten days before and after recommendations than during the longer periods around the recommendations' average traded volumes (20 days and 40 days respectively), which might indicate that analysts often 'piggy-backed' on news and information events, like earnings- or dividend announcements, that were expected by investors (Altinkiliç and

Hansen, 2009). It may be questioned how often investors anticipated a release of new information, and how often analysts issued recommendations around expected or diarised company news events?

Not all revision categories received the same amount of attention from the analysts when the number of revisions per revision category is considered, while investors also did not seem to pay the same amount of attention to the different revision categories when abnormal traded volumes are evaluated. Analysts seemed to prefer to move from hold recommendations to other recommendation categories and *vice versa*, which is to be expected if analysts will advise investors to hold a share after a fair valuation in the mind of the analyst has been reached.

Not all recommendation revision categories coincided with the same ratio of increased traded volumes. Negative information from analysts produced a slightly greater response from investors when compared to positive information. The positive bias that is believed to exist among the majority of analysts (Barber *et al.*, 2001; Morgan and Stocken, 2003; Prayag and Van Rensburg, 2006) could have lessened the attention of investors when positive recommendations were issued because investors may trust the validity of a negative opinion more. Investor attention following negative recommendation revisions may have been the strongest of the revision categories because negative revisions were rare events and away from the expected analyst behaviour.

Information events that coincided with a large abnormal return also coincided with increased investor attention in the form of traded volumes. This result is indicative of enough liquidity for a broad range of investors to react to new information, showing the availability of both sufficient breadth and depth for market participants.

A positive (negative) relationship between the abnormal returns and investor attention that surrounded upgrades (downgrades) was evident. Although the AR-effect of upgrades produced short-term consequences on day t+1 and downgrades did not, the price volatility that was associated with negative news showed that investors agreed about the direction of returns more than for positive news.

Now that questions regarding the traded volumes (as proxy for investor attention) and price volatility of each revision category have been discussed, the next chapter presents the overarching and chapter-specific conclusions of Chapters 2 to 5. The research questions covered in Chapter 5 are updated in Figure 5.3, concluding the use of the game-board map of the study.

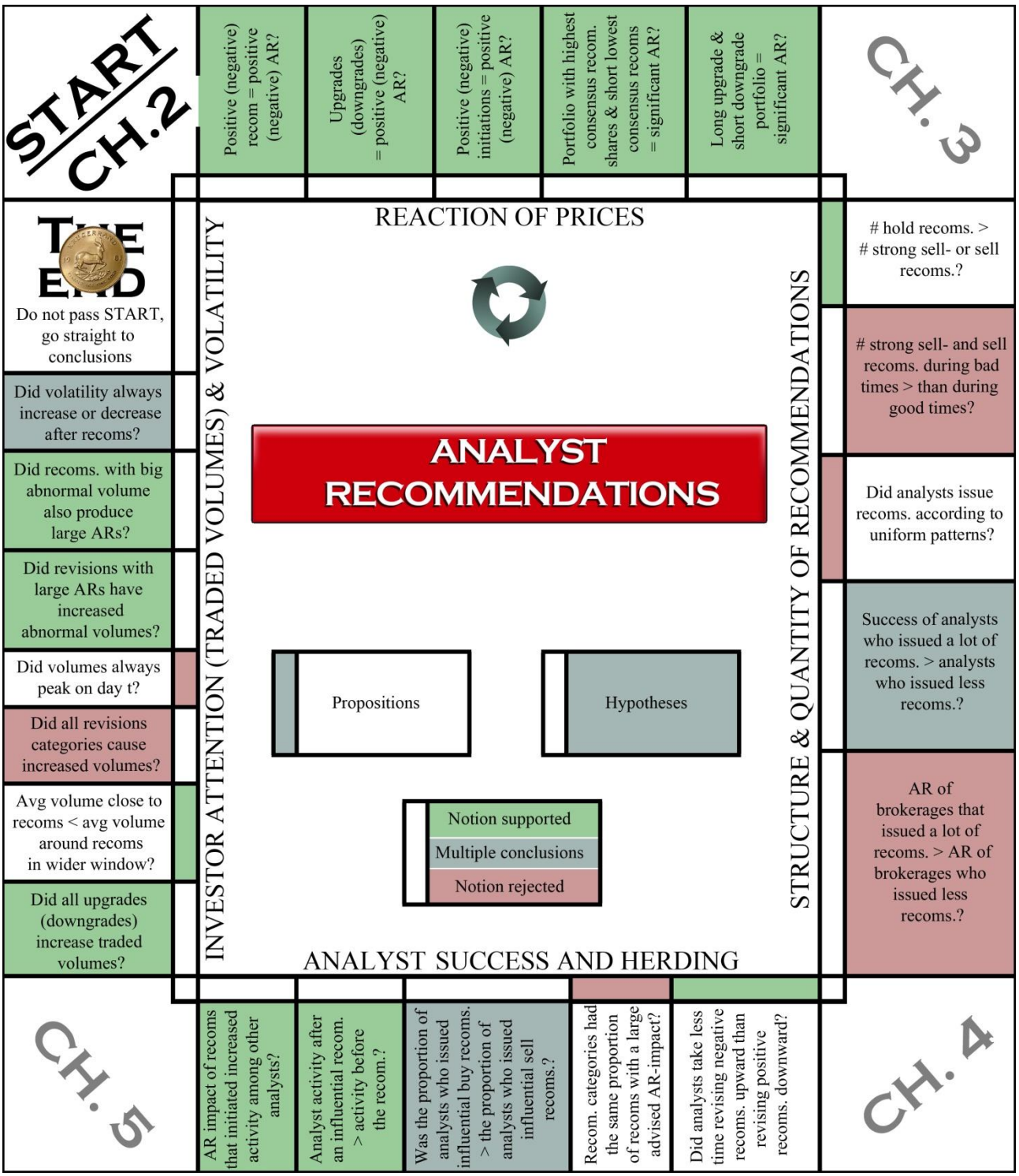

Figure 5.3: Game-board map of the study: Chapter 5

CHAPTER 6:
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The main aim of this study was to investigate the impact of analyst recommendations on JSE-listed shares in the contexts of both the semi-strong form of the efficient market hypothesis (Fama, 1970) and some of the behavioural biases that create diverse opinions among investors who have access to the same information (Harris and Raviv, 1993). This chapter firstly contains the overarching deductions drawn from the results of the four preceding empirical chapters. The interpretation of the results in the light of the two main theories is also interwoven into the discussions found in this chapter. The specific results and contributions per chapter are presented in the last section of this chapter.

6.1 OVERARCHING CONCLUSIONS FROM ALL CHAPTERS

Although the body of work investigated specific research questions demarcated by chapters, a 'golden thread' ran through the investigation into the impact of analyst recommendations on JSE-listed shares. This section aims to present concepts and patterns that were present or evident in more than one chapter but not discussed yet because it did not form part of the specific research question or focus of the chapter.

6.1.1 Recommendations under the EMH

The results in this study demonstrated that the short-term impact of recommendations on share prices was significant for both positive and negative recommendations over the short term. Overall, the analysts did demonstrate either (i) to be able to impact the prices of securities by challenging and changing the prevailing market consensus opinion through the issuance of recommendations, or (ii) to time their recommendations with other information flows in cases where they 'piggy-backed' correctly by interpreting new information correctly. The aforementioned two points further indicate the resilience of the JSE because it was able to incorporate new information and handle abnormal price movements and traded volumes under the semi-strong form of the EMH. The abnormal traded volumes following recommendations thus indicated that the market was able to provide higher liquidity than normally, irrespective of the amount of agreement surrounding the prevailing price levels. This result corresponds to the body of international evidence.

The significant positive (negative) abnormal reactions to positive (negative) recommendations visible over all the chapters show that the response of investors to analyst recommendations was not purely random in nature. The upgrades and downgrades generally did have an 'advised' response relative to the sentiment conveyed by the analyst. This pattern also supports the notion of semi-strong efficient markets because the markets were able to react to new information.

Two unexpected results were:

(i) The two four-step revision categories' inverted average impact on prices when only measuring high LFR recommendations. This result was unexpected because the analysts and the investors did not agree on the direction or the magnitude of the price change when the analysts issued recommendations with the largest revision category jump possible; and

(ii) The decrease in volatility after negative recommendations were issued, as prices should be expected to fluctuate more after new information is released, irrespective of the information being positive or negative.

6.1.2 Dissimilar reactions

This dissertation is the first body of work that uses the 'differences of opinion' theory's framework (Harris and Raviv, 1993) to contextualise the reactions of investors following the release of analyst recommendations. Analysts and investors alike did not exhibit a uniform reaction to the recommendations at their disposal. Closer inspection revealed that not all recommendations and recommendation categories had the immediate advised reaction. The varying impact of recommendation categories is to be expected according to international literature. A measure of scepticism among investors probably existed because investors might expect a possible positive bias among analysts, as well as conservatism that might be displayed by some investors. Prolonged price-, abnormal return-, volume- and price-volatility reactions after recommendations further indicate a form of disagreement among investors that lasted more than a single day.

Not only did analysts not use uniform recommendation categories to distribute their opinions to the market, but they also reacted at different stages relative to each other as visible through the LFR ratio's results. 'Leader' analysts and 'first-mover' analysts did not only choose to react earlier than other analysts, but their reaction is most likely linked to skill and access to information. This might explain why not all positive (negative) recommendations resulted in a positive (negative) abnormal return, because investors may either have acted on the new information when it was released or waited for it to be confirmed by more analysts.

The magnitude and direction of the impact of revisions were also linked more to the categorical move than to the absolute level of the revision. For example, recommendations that upgraded to buy from hold did not have the same impact as recommendations that upgraded from strong sell to buy, even though both recommendations resulted in a buy-signal to the market. Market participants therefore did not only consider what analysts said would happen in the future, but also weighed new information relative to what was known in the past.

6.1.3 Behavioural aspects

A possible positive bias was evident in:

(i) Analysts' recommendation category preferences that varied strongly;

(ii) The time it took analysts to communicate revisions when comparing upgrades to downgrades;

(iii) The correlation analysis controlling for periods where analysts' sentiment changed; and

(iv) The way in which the proportion of sell recommendations *did not* increase during times of negative consumer sentiment or economic contraction.

A behavioural pattern therefore emerged among analysts, and empirically confirmed the stylised facts generally accepted from prior international and South African evidence.

The results further indicated that some analysts were more prone to issuing influential recommendations than others, and that not all analysts had the same skill in issuing influential recommendations. Analysts who issued a greater number of recommendations over time seemed to be more influential when issuing strong sells than other analysts.

Analysts further did not always act in a similar fashion as accepted under the EMH:

(i) Analysts did not choose the same recommendation patterns;

(ii) There was not consensus amongst them other over the prevailing recommendation level;

(iii) Analysts timed their recommendations differently; and

(iv) Some analysts chose to stop their coverage of a share when others issued sell recommendations.

The 'differences of opinion' theory therefore relates to analysts because analysts (i) disagreed about the recommendation category while agreeing about the direction of price changes, and (ii) disagreed about the sentiment in the form of positive versus negative recommendations and the timing of the recommendations when interpreting the same information.

6.1.4 Implications of the research for investors and analysts

The literature and results contained in this study offer various points of consideration for both analysts and investors. The following conclusions were drawn concerning analysts:

(i) They have an 'edge' in processing information over normal investors;

(ii) Analysts contribute to the efficiency of the South African share market;

(iii) Analysts' recommendations can affect share prices, but analysts must make sure they accompany their recommendations with enough credible information;

(iv) They do not necessarily have to have long track records to issue correct or influential recommendations;

(v) Their sells and strong sells had a greater frequency of an advised directional impact than buys and strong buys;

(vi) The natural skill of an analyst, the public's perception of the analyst and superior access to information may be factors separating the analysts from each other, and not necessarily the brokerage employing the analyst. The analysts' marketing may thus also be important to assure maximum exposure to investors;

(vii) The LFR for influential strong buys was lower than LFRs of other recommendation categories. Analysts aiming to be leader analysts should therefore not expect to generate a lot of activity among analysts when issuing strong buys, but can expect to have investors react to it more often.

Investors can take note of the following conclusions drawn from the literature and the findings:

(i) Investors should consider recommendations when they are facing investment decisions, but should avoid trading too often as it will reduce their total return on their investments;

(ii) Individual investors who intend on following an analyst or analysts should be aware that analysts might react differently from each other to the same information, in line with the 'differences of opinion' theory;

(iii) Negative news may often have a greater impact than positive news, and investors should expect prices to react accordingly and not be alarmed at large negative price movements;

(iv) Sells and strong sells had a greater frequency of an advised directional impact than buys and strong buys. This knowledge may offer opportunities to investors who specialise in shorting shares associated with negative news;

(v) Investors are cautioned to not necessarily expect that a recommendation will be influential because of the brokerage associated with it;

(vi) The increased activity and reaction of analysts do not appear to mirror those of investors as reflected in abnormal price moves. While the consensus upgrade-portfolios in Chapter 2 showed that there is investment value, investors should also pay attention when there is increased activity among analysts and especially when there is agreement;

(vii) Negative information from analysts produced a slightly greater volume response from investors when compared to positive information. Contrarian investors may be able to make use this opportunity around large downgrades by analysts to buy shares and incur low implicit trading costs due to the increased traded volumes.

6.2 SUMMARY OF SPECIFIC CONTRIBUTIONS PER CHAPTER

The specific contributions per chapter are highlighted in this section and contextualised with the existing body of knowledge from both local and international sources.

6.2.1 Chapter 2: The impact of analyst recommendations and revisions on the prices of JSE-listed companies

The relationship between new information in the form of analyst recommendations and subsequent abnormal share returns was analysed for the South African share market. The main objective was to determine if the semi-strong form of the efficient market hypothesis presented itself through recommendations that generate abnormal returns. This chapter established that equity analyst recommendations had a significant short-term impact on share prices by utilising an international database containing 31 363 analyst recommendations on JSE-listed and delisted companies, published over the period 1995 to 2011. In addition, two portfolio strategies were implemented. The first strategy shows that investing only in stocks with the most favourable consensus recommendations is associated with significant abnormal returns. The second strategy demonstrates that a portfolio consisting of recently-upgraded stocks earns positive abnormal returns, while a portfolio consisting of downgraded stocks is associated with negative abnormal returns.

Only three other studies with very limited data and methodologies were completed on the impact of recommendations on JSE-listed shares before this study was published. This study was the first South African study to:

(i) Use daily data and recommendations from local and international analysts;
(ii) On all JSE-listed and delisted shares in an unbiased manner;
(iii) Over an extensive period of time.

Although international research has demonstrated that positive (negative) information generated by analysts was associated with positive (negative) daily abnormal returns, this study was the first to support this theory for JSE-listed shares over the 1993 to 2011 period.

Furthermore, this study is the first South African study to suggest that revisions have a stronger influence than historical recommendation levels by means of implementing both a short-term abnormal return- and portfolio constructed methodology. The two portfolio strategies yielded results suggesting that both the consensus-recommendation level portfolio (taking all recommendations into account) and the recommendation revision portfolio (taking only recently-revised recommendations into account) contain potential value for investors on the JSE. The revision portfolio did deliver stronger returns than the consensus-recommendation portfolio. The

methodology used to calculate the rolling 21-day recommendation-revision portfolio has not been implemented before by any study internationally or locally.

6.2.2 Chapter 3: Analysts' recommendation preferences and the incidence of the execution of advised actions by investors

The purpose of Chapter 3 was to identify whether analysts reacted uniformly to information when issuing recommendations for JSE-listed shares, and to test for a possible positive bias because analysts are expected by investors to offer information in an unbiased and accurate manner. The overall recommendation tendencies during periods of positive and negative sentiment were investigated and the preferred recommendation patterns amongst analysts identified. The ability of individual analysts to frequently cause an abnormal impact on share prices was also examined. Lastly, the impact of recommendations by analysts who worked for brokerage houses where many recommendations were issued was measured to investigate if brokerage house activity influenced market reaction.

While previous local and international studies measured the average positive bias (strong buy and buy recommendations versus total number of recommendations) over the entire sample, this study also investigated a possible positive bias per annum over the entire sample period, during economic growth phase periods, and over periods of high- and low business confidence. The annual distribution of recommendations was used to investigate the flow of positive versus negative recommendations as analyst sentiment changed during different cycles. According to the author's knowledge, no other international study has investigated either recommendation 'flow' versus overall analyst sentiment, or the proportional differences during different phases in the economy.

Analyst activity was compared to the analysts' preferred recommendation distribution patterns to determine if analysts acted uniformly through activity levels. Although the results are descriptive in nature, no other study has described its sample of recommendations in this format before.

The incidence of recommendations generating positive abnormal returns versus activity levels of analysts and the brokerages employing the analysts were investigated. Although the incidence of abnormal returns versus activity has been researched internationally, this is the first study to investigate this for JSE-listed shares. Influential recommendations did not occur very often, and sells and strong sells had a higher frequency of causing negative abnormal returns than positive recommendations in causing positive abnormal returns. Analysts who issued many recommendations were not found to have a greater influence on share prices than other analysts. The investigation into the incidence of abnormal returns versus the brokerages' total activity is an international first.

6.2.3 Chapter 4: Influential analyst recommendations and subsequent analyst activity

Chapter 4 mainly investigated the activity of individual analysts relative to the activity of other analysts on a per-share basis by calculating leader-follower ratios (LFRs). Further questions that were asked included:

(i) How much time individual analysts took between issuing recommendations per share and per analyst portfolio;

(ii) How often individual analysts issued recommendations that broke certain AR thresholds; and

(iii) If recommendations that initiated increased activity among analysts also caused a reaction among investors as measured by ARs from share price movements?

Chapter 4 contains the first research that measured analyst activity per share and analyst activity relative to total analyst coverage for JSE-listed shares. The methodology has been applied on international data.

Chapter 4 is also the first research in South Africa to investigate how many analysts issued influential recommendations that caused abnormal returns greater than a one per cent, three per cent or five per cent threshold. The addition of a control group measuring analyst activity to this research question was also a first in South Africa, and the methodological approach of comparing the proportion of successful analysts among recommendation categories was an international first.

The leader-follower ratio (LFR) is internationally recognised and has been applied in two international studies. This study was the first in South Africa to measure analyst activity after influential recommendations, and also to investigate the abnormal return impact of recommendations with a high LFR.

6.2.4 Chapter 5: The effect of new information on investor attention and post-recommendation price volatility

Chapter 5 evaluated how analyst recommendation revisions influenced investor attention around recommendations and post-recommendation price volatility over the short term. This chapter used traded volume as proxy for investor attention and analyst recommendation revisions as a proxy for new information. The broad research questions addressed in the chapter asked:

(i) Whether investor attention increased with the release of new information;

(ii) Whether specific positive or negative information events had a greater impact on investor attention than other signals;

(iii) Whether influential recommendations (recommendations that caused a big abnormal price impact) coincided with increased investor attention and *vice versa*; and

(iv) Whether analyst recommendation revisions impacted or changed prevailing share price volatility levels?

The results suggest that significant short-term attention increases occurred within a short-term event window around recommendations, while normal traded volumes seemed to decrease just before and after the short-term event window around recommendations. Not all recommendation-revision categories had the same degree of impact, and abnormal volumes increased from the day before the release of new information to the day after. Negative information had a slightly greater impact than positive information. Recommendations with a large short-term abnormal return impact coincided with significant increased volumes and *vice versa*, while an increase in investor agreement concerning the direction of prices was visible.

The results from this chapter therefore indicate that increased attention existed among market participants following analyst recommendations, provided that sufficient liquidity is present in the market.

Although SVs were used in previous studies, the chapter's methodology has not been applied internationally or locally with regards to recommendations. Previous comparable research only measured (i) inattention (Loh, 2010) around recommendations by comparing two groups of shares (defined as low- vs. high average volume prior to recommendations) to each other, and (ii) volume reactions of all upgrades versus downgrades (Jegadeesh and Kim, 2006) for each day in a day t-10 to day t+10 window. Although Chapter 5 measured short-term investor attention to upgrades and downgrades (Hypothesis 5.1) relative to the total activity that occurred around recommendations in a similar fashion to Jegadeesh and Kim (2006), four new additional research questions were asked and new methodologies applied regarding volume.

This chapter is the first research in South Africa to measure investor attention in terms of standardised volume (SV) for all recommendation upgrades and downgrades, and to research if volumes peaked significantly more on day t than the other days surrounding recommendations.

With regards to recommendations, this chapter is the first research in South Africa and internationally to investigate:

(i) If traded volumes in close proximity to recommendation revisions was less than that of wider window periods;
(ii) If the individual revision categories caused a significant increase in investor attention;
(iii) If revisions that caused a significant impact on prices also increased traded volumes significantly; and
(iv) If revisions that caused a significant change in volumes also impacted prices significantly?
(v) Investor agreement around recommendations in terms of changes in price volatility;
(vi) Investor attention for (a) all upgrade- and downgrade categories and (b) per recommendation category;

(vii) The abnormal return impact of recommendations also associated with large SVs; and

(viii) Price volatility before versus price volatility after recommendation issuances.

The next chapter presents some limitations to this research and offers recommendations for future research.

CHAPTER 7:
LIMITATIONS AND FUTURE RESEARCH

7.1 LIMITATIONS

The limitations of any study invariably affect the depth of insight that can be gained from the results. Although this study aimed to be without bias by including all listed and delisted shares over a substantial period of time, the results of this study must also be regarded in the light of the limitations due to data restrictions and scope of the research.

The first limitation of this study is that the information concerning the analysts and the brokerages are limited. The age, gender, nationality, 'star'-status and educational background of analysts were unknown, while the number of employees, assets under management, age and reputation of the brokerages were also not disclosed. The reason why analysts left one brokerage for another were also not disclosed, and would have given insight into the perception that analysts might come under pressure when they issue negative recommendations.

The second limitation is that information concerning general news- and company-specific financial news events that preceded, coincided with or followed the release of recommendations was not available for the full sample period of 1993 to 2011. The study could therefore also not test if Savor's (2012) propositions of (i) different reactions to various types of information and (ii) under-reaction to news about fundamentals and overreaction to other shocks happened for JSE-listed shares. This prohibited the study from providing insight concerning the effect of confounding information in published-, electronic- and social media on the impact of recommendations. Future research will aim to at least align a portion of the total period to confounding news events. The study also covers the period during which the internet and social media were introduced to the worldwide markets which, in turn, created better information-dissemination efficiency. The study was unable to measure the influence of the aforementioned communication channels on the impact of analyst recommendations.

The last limitation was that daily closing prices were used in all calculations because 'tick-by-tick' time-stamped data was not available for this study. Insight into the immediate intra-day price moves would greatly enhance the understanding of market participants' reaction to new information because other macro-economic news could influence investors before or after the company-specific news was released.

7.2 FUTURE RESEARCH

The following areas have been identified for future research areas that will build on the analyst recommendation research presented in this dissertation:

(i) A sector- and industry specific analysis of the impact of recommendations.

(ii) An investigation into calendar anomalies, i.e. the day-of-the-week effect, the October effect, the effect of sports events, etc.

(iii) The ability of analysts to influence investors during and after times of market crisis. The "Dot-Com bubble" and the "Sub-Prime" crises are two recent examples that can be researched.

(iv) Further investigations into the value of consensus-recommendations for investors and how it can be used in trading strategies. Out-of-consensus recommendations and their relative performance impact will form part of this study.

(v) The influence of earnings announcements, dividend declarations and profit warnings on the reaction of stock prices to analyst recommendations.

(vi) The possible effect of confounding news on the price-impact of recommendations should be measured.

(vii) The accompanying price-target reports of analysts should be investigated to measure the predictive accuracy of analysts.

(viii) The impact that 'first movers' among the analysts have on share prices and other analysts. The differential impact between 'first mover' analysts and 'follower' analysts can also be investigated here.

(ix) Can analyst recommendations and general analyst sentiment be used as a leading indicator for economic growth phases?

(x) Price drift patterns and price momentum before and after recommendations.

(xi) The persistence of analysts' performance ranking over time.

(xii) How do the analyst recommendations correspond to the trading within registered equity funds?

(xiii) Can an investor create profitable after-cost portfolios by implementing analyst recommendations?

The aforementioned research areas all build on analyst recommendations alone, and exclude the analyst reports that often accompany these recommendations. The accuracy of earnings forecasts and price targets represent a field of investigation that should also be scrutinised to fully appreciate the accuracy and influence of analysts.

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APPENDIX A: EXAMPLE OF ANALYST REPORT

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i.f.r .co.za
independent fundamental research

Company Results Analysis — 25 May 2012

Recommendation:
SELL

JSE Code:
MPC

Current Share Price:
9648c

MR PRICE GROUP LTD

Sector: Apparel Retailers

Nature of Business

Mr Price Group is a fashion value retailer, selling predominantly for cash. The group retails apparel, homeware as well as sportsware, with brand names include Milady's, Mr Price, Mr Price Home, Mr Price Sport and Sheet Street.

MR PRICE GROUP LTD — JSE Ticker: MPC

Year-end results for the period ending Mar-12

Key Financial Data:			Mar-12	Mar-11
Headline EPS	503.0	HEPS Growth	20.1%	46.6%
Historical P/E	19.2	Turnover Growth	10.5%	12.6%
NAV	1 139.5	Operating Margin	14.4%	13.2%
P/NAV	8.5	Interest Cover	100.0	100.0
Current assets NAV	914.5	Effective Tax Rate	31.8%	31.8%
NTAV	1 097.3	ROE	55.1%	54.5%
DPS (last 12 months)	314.0	Debt/Equity	-35.5%	-48.9%
Dividend Yield	3.3%	Cash/EPS	0.9	1.1
PEG Ratio*	125	ROC	47.9%	45.6%
Share Price	9 648	Quality Rating*	100%	100%

**See Value Investor and/or Quality Investor*

Comments on results:

The group reported a strong set of results for the year ended 31 March 2012. Retail Sales for the period increased by 10% to R11.8bn while like-for-like sales increased by 8%. On a 52 week on 52 week basis sales increased by 12% supported by a 5% increase in selling price inflation and a 7.6% increase in units sold. The group opened 46 new stores during the year and closed 21, bringing the total number of stores up to 962. The group's average trading space however remained unchanged, due to the closing of underperforming stores. Other revenue grew by 23% largely due to a 48% increase in premium income relating to the sale of financial services products and a 20.3% increase in interest on trade receivables. Gross profit increased by 11% to R5.3bn, while gross margins remained stable at 43.5%. Adjusted operating profit grew 21% to R1.75bn aided by a continued focus on cost management. As a result, adjusted operating margins increased from 13.2% to 14.4%.

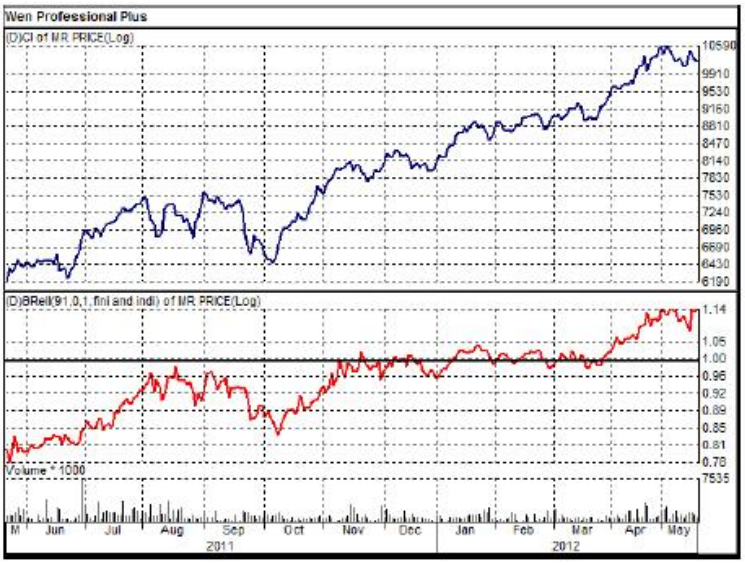
A 19% reduction in net finance income to R44m was the result of lower average cash balances and lower average interest rates translating into a 19% increase in EAT to R1.2bn. During the year, the group purchased Treasury shares to the value of R260.2m, at an average price of R67.52 per share which resulted in a 1% decrease in the weighted average number of shares issued. Ultimately, HEPS rose 20% from 418.9 cents to 503 cents. The final gross dividend declared increased 26% to 220.4cps and is subject to dividend withholding tax at 15%. Shareholders who are not exempt from dividend tax will receive a net dividend of 187.34cps, which reflects an effective dividend increase of 6.9%. Cash generation for the period was affected by a R517m increase in working capital.

Operational Overview:

-Apparel: (contributed 72% to group revenue and 87% to group operating profit)
Revenue increased by 11% to R8.7bn, supported by selling price inflation of 4.6%. Operating profit grew 16% to R1.5bn. This translated into an increase in the operating margin from 16.7% to 17.5%.
*Mr Price:
Revenue increased by to 13.2% to R6.5bn (55.6% of group sales) as the segment increased its market share in both clothing and footwear, while opening 16 additional stores.
*Mr Price Sport
This division's performance exceeded expectations, with a 26.5% increase in sales to R686m while opening 7 additional stores during the year.
*Miladys
Despite closing 10 stores during the period, divisional sales grew 11.2% to R1.1bn supported by particularly good sales growth achieved in the second half of the year of 15.4%. Improved cost management lead to an increase in the operating margin.

-Home: (contributed 28% to group revenue and 21% to group operating profit)
Revenue grew 8% to R3.4bn, supported by selling price inflation of 5.9%. Operating profit increased sharply by 38% to R373m, which resulted in an improvement of the operating margin from 8.7% to 11.1%
*Mr Price Home:
The division managed to increase sales by 9.9% to R2.3bn, while sustaining a stable gross margin.
*Sheet Street:
Sales rose by 12.4% (2011: 12%) thanks to increased market share, and higher trading density. This resulted in divisional revenue of R1bn being exceeded for the first time. Operating profits rose significantly, which resulted in improved operating margins.

-Central Services: (contributed -8% to group operating profit)
Central services provide services to the trading segments, including IT, internal audit, human resources, group real estate and finance. The segment's operating loss increased slightly from R144m to R147m.



Company Prospects:

In order to support the group's geographic and business growth, 70 new stores will be opened during the forthcoming year which includes expansion of profitable stores and size reduction of poor performing stores.
This will lead to a 5% increase in the average trading space, which is in line with the group's long-term growth plans. An apparel test store was opened in Nigeria on 29 March 2012, while another is expected to open in Ghana during June 2012. The group plans on investing in its supply chain activities and IT operations in order to build world class capabilities, while at the same time maintaining its focus on the local retail market. Management remains positive on the group medium term prospects despite the complex needs of a business which is growing in both size and geography.

Comparative Analysis:

Code	Price (cps)	Actual ROE (%)	Op Margin (%)	Cash/ HEPS	Interest Cover	Quality Rating (%)	P/E #	PEG (P/E) (%)	P/ NAV	Div Yield (%)
MPC	9 648	55	14.4	0.9	100.0	100	18.7	125	10.5	3.3
TFG	12 009	27	23.2	0.4	9.2	60	15.4	91	3.9	3.3
TRU	8 090	46	25.6	0.8	No Debt	85	15.9	94	5.3	1.7
WHL	4 806	49	8.4	1.2	25.6	93	18.3	122	8.0	3.5

For updated values and additional information refer to the "Value Investor" and "Quality Investor" on the PSG-Online website.

Rolling PE: The P/Es provided by IFR will differ from those in other publications as we use a more accurate rolling P/E. The rolling P/E formula calculates the EPS the company earned for the last 12 months up to the current date. It is, therefore, always comparable with its peers, notwithstanding different year-ends.

Recommendation:

Mr Price remains an excellent company with an impressive track record. The group boasts a high ROE, high operating margins and strong cash generation, and is in a position where it is not likely to be affected to the same degree as the credit retailers in the face of more challenging trading conditions. We believe Mr Price will continue to perform well over the medium to longer term through its well-executed value strategy to sell fashionable products at everyday low prices. Trading on a historic PE ratio of 19.2 times we feel the share is fully valued and would recommend shorter term investors to sell their shares.

and/or value and investors may get back less than originally invested. Past performance is not indicative of future results. The employees of IFR may from time to time own securities mentioned herein.

Analyst Certification

The research analyst who prepared this report certifies that the view expressed herein accurately reflect the research analyst's personal views about the subject security and issuer and that no part of his compensation was, is or will be directly or indirectly related to specific recommendations or views contained in this report.

APPENDIX B: EXTRACT FROM I/B/E/S DATA FILE

TICKER	@2XA	The listed company's ticker in I/B/E/S database
CUSIP	KS651744	The CUSIP identifier for the listed company is a unique alphanumeric identifier for individual securities
CNAME	ACUCAP	The name of the listed company
ACTDATS	26/06/2006	Date that the recommendation was recorded by Thomson Reuters
ESTIMID	FIRSOUTH	The brokerage or company employing the analyst
ANALYST	ALLISON, L	The analyst's name
ERECCD	5	Estimator code of the recommendation
ETEXT	UNDERPERFORM	Estimator text of the recommendation
IRECCD	5	I/B/E/S recommendation code
ITEXT	SELL	I/B/E/S description of code
EMASKCD	7783	Estimator Mask Code
AMASKCD	47050	Analyst Mask Code
USFIRM	0	USA company (1=True)
ACTTIMS	12:46:08	Activation Time
REVDATS	2006/10/07	The last time that the concurrent recommendation has proved to be valid
REVTIMS	13:19:33	Review time
ANNDATS	26/06/2006	The date that the recommendation was first announced
ANNTIMS	00:00:00	Time that the recommendation was reported.

APPENDIX C: RMB/BER BUSINESS CONFIDENCE INDEX LEVELS

Date	BCI	Date	BCI	Date	BCI
Mar-93	21	Jun-00	36	Sep-07	72
Jun-93	17	Sep-00	39	Dec-07	67
Sep-93	22	Dec-00	30	Mar-08	48
Dec-93	31	Mar-01	33	Jun-08	45
Mar-94	37	Jun-01	39	Sep-08	34
Jun-94	57	Sep-01	38	Dec-08	33
Sep-94	45	Dec-01	47	Mar-09	27
Dec-94	67	Mar-02	57	Jun-09	26
Mar-95	66	Jun-02	68	Sep-09	23
Jun-95	65	Sep-02	68	Dec-09	28
Sep-95	53	Dec-02	64	Mar-10	43
Dec-95	64	Mar-03	59	Jun-10	36
Mar-96	51	Jun-03	50	Sep-10	47
Jun-96	42	Sep-03	54	Dec-10	44
Sep-96	34	Dec-03	61	Mar-11	55
Dec-96	42	Mar-04	68	Jun-11	48
Mar-97	45	Jun-04	70	Sep-11	39
Jun-97	38	Sep-04	79	Dec-11	38
Sep-97	32	Dec-04	87		
Dec-97	29	Mar-05	78		
Mar-98	29	Jun-05	82		
Jun-98	17	Sep-05	86		
Sep-98	13	Dec-05	84		
Dec-98	12	Mar-06	85		
Mar-99	12	Jun-06	81		
Jun-99	15	Sep-06	85		
Sep-99	25	Dec-06	83		
Dec-99	36	Mar-07	80		
Mar-00	44	Jun-07	80		

Source: Bureau for Economic Research (BER), 2014.